



Master's Degree in Library and Information Science (MLIS)



“शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।”

— इन्दिरा गांधी



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“Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances.”

— Indira Gandhi



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November, 2006 (Reprint)

©Indira Gandhi National Open University, 2006

ISBN : 81-266-2204-0

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Further information on the Indira Gandhi National Open University courses may be obtained from the University's Office at Maidan Garhi, New Delhi-110 068.

Printed and published on behalf of the Indira Gandhi National Open University, New Delhi, by Director, School of Social Sciences.

“Paper Used: Agrobased Environment Friendly”

Laser Typeset by : Rajshree Computers, V-166A, Bhagwati Vihar, Uttam Nagar, New Delhi-110059

Printed at : Dee Kay Printers, 5/16, Kirti Nagar Indl. Area, New Delhi-110015.

COURSE INTRODUCTION

The modern society is a society of institutions. Every task, whether economic performance or health care, education or protection of environment, the pursuit of new knowledge or defence is being entrusted to the care of big organisations. Therefore, on the performance of these institutions rests the performance of the modern society—if not the survival of each individual would remain unattended. In this context knowledge institutions such as, libraries, documentation centres information centres, etc. play a very vital role. The primary objective of this course is to provide necessary background information relating to different types of information institutions and the various types of information services and products to the learners of this programme.

Block 1: Information Institutions

This Block, comprising four units (1-4), deals with information institutions for various kinds that had sprung with the needs for a variety of products and services that were developed. Different institutions were necessary to be instituted at different periods with varying functions, activities and programmes. These different types of institutions are discussed in this Block.

Unit 1 gives a historical perspective of information institutions that began to take shape delineating their evolution on the basis of the information transfer process with corresponding value systems along with the significant features associated with three eras, viz. 1) Discipline-oriented Information Transfer, 2) Mission-oriented Information Transfer, 3) Problem-oriented Information Transfer. The institutions that developed with this type of information transfer are discussed with examples. Dealing with the institutions that are springing up with Knowledge Based Economy, examples are cited the way they are growing. The Indian scenario is discussed in the context of institutional development process with examples. Looking at the future prospects, the Unit places emphasis on institution building as a necessary process to handle newly developing need-based information institutions.

Unit 2 of this Block discusses Information Centres, as a distinct form of information institutions that arose with the special needs for higher levels of services. These became essential for information support for business, trade and commercial organisations, government departments and research organisations. The different kinds of information centres are described with the typical products and services they offer. Most of these products and services, which are increasingly becoming computer-based are also explained. An outline of the management of these types of information institutions with their specific functions, products and services is also given. Some illustrative examples of information centres at the local, national, regional and international levels are also given.

Unit 3 defining data as facts and figures, used as a basis of reasoning, discussion or calculation, describes data activity in wide variety of disciplines. This involves operations like gathering, compilation, processing, evaluation and dissemination. Data centres perform these activities in different subject fields. The establishment of CODATA, which is an important landmark, is indicated. Several other data centres in national and international, in scientific disciplines and social sciences are briefly described. Distinguishing referral service from reference service, explains the functions and activities of a few referral centres, at the international and national levels.

Unit 4 deals with the Information Analysis and Consolidation Centres that are subject based and offer products and services, which require high professional skills and subject knowledge. The different products of such centres are explained with examples. The planning and management processes of IAC Centres are emphasised. Information

Analysis Centres in India are examined, accentuating on the special need for an Information Policy in developing such centres.

Block 2: Information Sources, Systems and Programmes

This Block (Units 5 to 9) describes information sources and resources, their variety, their reference value, information systems that have been developed and specific programmes at the national and global levels.

Unit 5 of this Block identifies categories of information sources and resources distinguishing their differences. The former is related to library and information science and the latter to information and communication technologies. An outline of documentary and non-documentary sources is given with examples. The non-documentary sources comprise human and organisational sources. A fairly exhaustive list is given with descriptions of their skills, expertise and their reference value.

Unit 6 gives a good overview of print media, non-print media and storage media. While relative advantages of each of these media is explained, they are bound to co-exist, without displacing the other. The print-media include a variety of documents; the non-print media includes electronic, cyber media and virtual reality media. The storage media deal with optical, magnetic and microforms.

Unit 7 gives an exhaustive survey of national information systems and programmes operating in India. These pertain to systems in science and technology, social sciences, and humanities and programmes related to language-literature.

Unit 8 of this Block deals with global information systems, which include general information systems, subject oriented and specialised information systems. **Unit 9** describes both national and international organisations, which include both government and non-government organisations. The two other special organisations described in this Unit are Chemical Abstract Service (CAS) and MEDLARS. These two nationally controlled systems with international coverage of their respective subjects have been operating for a century and more in the case of MEDLARS. They are not only popular in terms of use but provide extremely well organised services respectively in Chemistry and Chemical Technology and Medical Sciences in its entirety. However, these systems have been described in detail in Unit 8.

Block 3: Information Products and Services

Block 3 (Units 10 to 13) covers a wide range information products and services, briefly describing the techniques and tools in their preparation, and offering a variety of services.

Unit 10 deals with grey literature, which have been a major category of information products, which are quite often sought by users. Newsletters, House Journals, Trade Bulletins, are described giving a quick historical background, their characteristics, functions, impact of ICT, bibliographic control, etc.

Unit 11 expatiates consolidation and repackaging of information, which includes reviews and related publications, state-of-the-art reports, trend reports, technical digests, which are specifically orienting towards users needs.

Unit 12 deals with literature search services and technical enquiry services, with particular reference to ICT. Document Delivery Services (DDS) are given a fairly extensive treatment, their origin, growth, new models, challenges in the context of ICT, and the institutions that have been specialising in this service. Similarly translation services have been explained with their importance, the vicissitudes in their growth, machine translation, etc. DDS as well as the translations services are seen in the Indian context also.

Unit 13 handles a group of library and information services in relation to some of the techniques and tools required to organise them. Electronic information services, and in particular, citation-analysis-based services are described in considerable detail. Various aids to information sources are also given.

Block 4: Information Intermediaries as Sources of Information

This Block introduces specialists and experts as sources of information, a very significant and potential group involved in a variety of information systems. This source is not tapped mostly because this does not form part of a formal organised information system. Often this source refers to persons who operate in various information systems and services in designing, developing, and servicing, applying information and communication technology.

Information Intermediaries are agents acting between persons, parties, points, stages, things, and establish appropriate contacts, with a view to help and assist the two ends, viz. a user and a database. This Block draws attention to six types of intermediaries, involved in various programs and activities of information systems. As this is a somewhat veiled source, their use depends on the knowledge of different situations in which intermediaries could be effectively used, who have the requisite skills, expertise and experience. The utility of these experts depends upon the manner in which they are approached for information, which may not be available at all, in any documented form. It may indeed be a difficult source to access and use too. For, experts may not be willing to be used as sources for valid reasons of their own. Yet they constitute very effective and invaluable sources of information for areas, which are highly specialised. If the experts are sufficiently compensated or motivated for giving their expertise or skills, these sources may be of immense value. The six units (Units 14 to 19) which deal with this type of sources of this Block, are briefly summarised below:

Unit 14 highlights two categories of experts, the first being library experts, operating in different functional designs and development, operations and services in libraries. The second category is a wide variety of information professionals, constituting experts who are associated with information activities in one way or the other. These two groups could serve as useful sources when any information is required at depth in their respective fields of specialisation. The functions and activities of these experts are explained with their potential reference value.

Unit 15 presents a group of experts who have conspicuously grown in the context of scientific and industrial research, business environments, in problem solving solutions for a variety of socio-economic developments, and a number of similar activities. A variety of such groups have grown which include Information Brokers, Information Consultants, Online Vendors, Technological Gatekeepers, Invisible Colleges, Information Filters, Intelligent Agents, Extension Workers, Paramedical Professionals, Block Development Officers, etc. Their roles and functions in different contexts are explained indicating the special skills they have. Some of them are operational in a commercial environment charging for their services. There are also services, which are free. Unlike the groups that are mentioned in the other units of this Block, this group is much more visible and comparatively easier to be accessed and high quality services can also be obtained. ICT-based intermediaries such as Internet, Filtering Software, Expert Systems and Electronic Brokerage are also explained. In the Indian context, the emergence of intermediaries such as gatekeepers, information consultants and extension workers, paramedical professionals is noteworthy.

Unit 16 focuses attention on intermediaries, functioning as database designers and managers. A brief description of the basic concepts of information systems, databases, etc. is given to put the discussions in a proper perspective. The different persons

involved in database designs and operations are identified with their particular part in these activities. A few categories of information system professionals are listed with explanation of their specific functions. The particular emphasis in this Unit is on the role of these intermediaries as resource persons and their value in training users of information systems. Doubtless these intermediaries would serve as invaluable sources of information in very highly specialised areas, if they are judiciously tapped.

Unit 17 is specifically on database intermediaries who connect users with databases. It is the primary role of a database intermediary to translate a user's need into a query to obtain answers. The different functionalities of an intermediary as a searcher, editor and their interaction with users are explained. Touching upon the future of database intermediaries, the role of web intermediaries as computational entities is briefly discussed. Despite these technological advances, the role of persons as database intermediaries would continue to be invaluable as sources of information.

Unit 18 deals with another set of potential sources of information, viz. the media persons. Media is one of the most powerful instruments for shaping public opinion and public policy. Persons operating in the different mass media such as newspapers and periodicals, radio, television, etc. are explained with their expertise and experience as potential sources of information. Advertisements and Public Relations are inseparably interlocked with media. Both are sustained by media and vice versa. The different categories of persons are identified and their reference value is highlighted.

Unit 19 deals with another group of experts who are functioning in designing and developing intelligent agents, using agents technology. An Intelligent Agent (IA) is autonomous or semi-autonomous user-friendly software that is capable of taking decisions proactively and assist a user in an intelligent way by learning from the user. It can be in an independent or collaborative manner, move from one machine to another, and run on a wide variety of computer platforms. The two categories of IA are Industry Intelligent Agents and Internet Intelligent Agents. The object of the former is to provide intelligent inputs to improve various industrial processes and the object of the latter is to reduce information overload and reduce the tedious tasks of navigation and access. The different characteristics of IA are summarised in a table with their meanings. All IAs are put through the Turing Test. Analogous to human learning, IAs are made to learn through various procedures. The five types of Internet Agents are:

i) E-mail Agents to manage e-mail of the user; ii) Web Browsing Agents, designed to improve the efficiency of search on the Internet; iii) Information Agents, viz. Information Retrieval (IR) Agents and Information Extraction (IE) Agents, performing respectively the functions of search and listing documents and performing an advancement of IR, both have built-in learning capability; iv) Frequently Asked Questions (FAQ) Agents are specially designed to answer questions that are frequently asked, and v) Web Mining Agents that discover from websites valuable information that may be hidden in their contents. Distributed Agents are a group of intelligent agents that are located at different geographical locations via network infrastructure to solve large problems. Their designs and functions are explained briefly. Mobile Agents are those that are capable of moving from machine in a heterogeneous network environment and executing themselves on any machine. A few other IAs like Typed Messages Agents are also briefly described. Agent technology has evolved not only from Artificial Intelligence technology but also has drawn extensively from distributed computing and databases, software design and network technology. All these have been succinctly presented in this Unit with clarity for easy understanding. Persons who are associated with IAs are a potential source who constitutes a rare group of experts.

The background of the page features a large, light gray watermark of the Open University logo. The logo consists of a stylized 'U' and 'O' forming a circular emblem, with the text 'Open University' and 'THE PEOPLE'S UNIVERSITY' integrated into the design.

BLOCK 3

**INFORMATION PRODUCTS
AND SERVICES**

UNIT 10 INFORMATION PRODUCTS – PART-I

Structure

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Newsletters
 - 10.2.1 History of Newsletters
 - 10.2.2 Favourable Factors
 - 10.2.3 Types of Newsletters
 - 10.2.4 Functions/Purpose
 - 10.2.5 Contents
 - 10.2.6 Electronic Newsletters
 - 10.2.7 Benefits of e-mail Newsletters
 - 10.2.8 Bibliographical Control
- 10.3 House Journals
 - 10.3.1 History of House Journals
 - 10.3.2 Categories of House Journals
 - 10.3.3 Contents of a House Journal
 - 10.3.4 Characteristics of House Journals
 - 10.3.5 Bibliographical Control
- 10.4 Trade and Product Bulletins
 - 10.4.1 History of Trade Catalogues
 - 10.4.2 Characteristics of Trade and Product Bulletins
 - 10.4.3 Functions of Trade and Product Bulletins
 - 10.4.4 Sources of Trade Literature
 - 10.4.5 Bibliographical Control
- 10.5 Summary
- 10.6 Answers to Self Check Exercises
- 10.7 Keywords
- 10.8 References and Further Reading

10.0 OBJECTIVES

After reading this Unit, you will be able to:

- understand the importance of information products such as newsletters, house journals and trade and product bulletins;
- identify the types and characteristics of these information products;
- explain the role played by newsletters and house journals in promoting the image of an organisation;
- know the role played by trade and product bulletins in promoting products and services of corporate bodies;

- assess the problems involved in bibliographical control of these information products; and
- comprehend the impact of technology on these information products and communication pattern of commercial organisations like manufacturers, distributors, etc. of various industrial product, process, material, or service.

10.1 INTRODUCTION

In this Unit, you will study about the information products issued by industrial, commercial, public service, or similar organisations, as promotional material for the target audience. These products are newsletters, house journals, and trade and product bulletins. These publications inform the public about the performance of an organisation, its latest activities and its products and services. The basic purpose of these information products is to enhance the image of the organisation and promote its products and services. Newsletters communicate news of the latest activities of the organisation to the target audience in a timely and speedy manner. House journals inform the employees and customers about the performance and style of functioning of the organisation. Trade and product bulletins usually issued by manufacturers, distributors and commercial publishers, serve a dual function. These publications provide information on various attributes of the product, process, material or service and also promote their sale. Advances in computers and telecommunication technology have great impact on the communication patterns of industrial, commercial and public service organisations. They are promoting themselves through electronic information products like e-newsletters, business homepage on the Internet and e-commerce.

10.2 NEWSLETTERS

Newsletter can be defined as a serial consisting of one or a few pages in print, electronic or any other form, containing recent information or news which is of interest to a special or particular group of users and which is published periodically. Organisations often issue newsletters to members or subscribers.

10.2.1 History of Newsletters

Newsletters are forerunners of modern newspapers, current in use in 1600s and early 1700s, which presented news for general circulation. The earlier printed newsletters or news-sheets, which were often called *corantos*, *courants*, *occurents* or *intelligencers* were published in Europe's commercial centres. These newsletters contained business news and news of other public events likely to interest bankers and merchants. Newsletters were then followed by news-sheets. Official news-sheets began to appear during 1500s. *Notizie Scritte* (written notices) were posted up in public places in Venice. They could be read on payment of a coin called a *gazetta*. The term *gazette*, a common name for early newspaper is derived from this practice. The first regularly published news-sheet seems to have been the *Avisa Relation oder Zeitung*. From 1609, this news-sheet was published weekly in Strasbourg, then in Germany. In the U.S. the first newsletter to make its appearance in 1704 was Boston News-Letter, which eventually became a newspaper. In fact, in the 1700s, many newsletters flourished, and in the 1800s, most of them went the way of newspapers.

By early 1900s, newsletters made a comeback, apparently, businesses and industries needed a specialised information medium badly and newsletters filled up this void. The first one to appear in 1904 was '*Babson's Reports*', an investment advisory newsletter. This was followed by *Kiplinger Letter* in 1923. This newsletter continues to be the most widely read business-forecasting periodical in the world. In the 1930s, corporate newsletters emerged rapidly. *Telecommunications Reports* (a telecommunication

industry newsletter) took the lead in 1934, this was followed by a series of newsletters. All types of newsletters ranging from farming to fashion became a common place. In 1964, the first newsletter about newsletters, *Newsletter on Newsletters* came out.

10.2.2 Favourable Factors

The wide availability of typewriters, and offset printing equipment contributed to the rapid growth of newsletters in 20th century, especially in 1960s and 1970s. In mid-1980s, the advent of personal computers altered the concept of the workplace rapidly. It was during this time, that the desktop publishing - the use of PCs to produce print material- became the buzzword. The desktop publishing and electronic delivery further speeded up the production of newsletters.

From 1990s, the newsletters have started appearing in another medium – online or web version – known as electronic newsletters. These e-newsletters are usually distributed by e-mail to people who voluntarily subscribe to them online. It is estimated that at present there are over a million newsletters published in the world. The circulation of these newsletters varies from free newsletters to thousands of subscription-based newsletters.

10.2.3 Types of Newsletters

Newsletters can be categorised into different types based on the publishing organisations such as:

- R&D Organisations (National and International);
- Associations (National and International);
- Government Organisations;
- Public Sector Undertakings;
- Private Institutions; and
- Academic Institutions, etc.

10.2.4 Functions/Purpose

Newsletters are publications, which are simple in format and provide speedy information for a definite group of audience. The newsletters are relatively easy, fast and inexpensive to produce. Most of the organisations issue newsletters to communicate news of their activities to the target audience in a timely and speedy manner.

- The Newsletter serves as a medium to:
- Publicise or promote products and services of the institutions;
- Announce current and forthcoming events like conferences, seminars or workshops; and
- Communicate information about social and cultural activities, personnel information, appointments, promotions, transfers, retirements, obituaries, etc. of the concerned institution(s).

10.2.5 Contents

Contents of newsletters are based on the purpose of the newsletter. Different types of newsletters cover different category of information. For instance, newsletters issued by R&D organisations carry information about programmes of the organisation, grants and fellowships, awards and rewards, forthcoming conferences/seminars/workshops,

etc., news from research institutions, reports on seminars conferences, etc. and technical / scientific articles e.g., International Sorghum and Millet Newsletter by ICRISAT (International Crops Research Institute for Semi-Arid Tropics). Newsletters published by associations cover president's reports/remarks, announcements of association, employment news, personnel information and other news of interest to the member community e.g., IASLIC Newsletter published by Association of Special Libraries and Information Centres. Newsletters from industrial enterprises are of two types, one for internal circulation and the other for external circulation. The newsletter for external circulation covers information about new products and services, highlights the achievements of the organisation, announces discounts and benefits for the customers, etc. Whereas the one for internal circulation covers news of the employees such as promotion, transfer, wedding, etc. announcements of welfare measures for the employees, social and cultural activities of the employees including sports, etc. and sometimes popular articles, short stories, jokes, etc. by the employees.

10.2.6 Electronic Newsletters

Newsletters published and distributed electronically over the computer networks are known as electronic newsletters. E-Newsletters started appearing in 1990s and have proliferated since then. These are distributed by e-mail to people who voluntarily subscribe to them online. Initially, e-newsletters contained hyperlinks to web pages - a method employed by website operators to draw users to their sites. However various studies on usage of e-newsletters showed that users were more interested in getting information from their e-mail account than from websites. So e-newsletters became full-fledged and content-rich publications. More and more people in business and industry are advertising their products through e-newsletters, as they believe that, their advertisements are better targeted and more effective than banner advertisements. From 1991 to 2001, the Association of Research Libraries (ARL) followed the growth of electronic publications through its annual "Directory of Electronic Journals, Newsletters and Academic Discussion Lists" (<http://www.arl.org/scomm/edir/archive.html>). This directory showed the amazing growth of e-serials in this ten-year period and predicted the continued prominence of Internet publishing scholarly as well as business communication.

10.2.7 Benefits of e-mail Newsletters

- E-mail newsletters are convenient and delivered straight to the user's information desk;
- E-mail newsletters have timely information and real-time delivery;
- E-mail newsletters are informative and keep users up-to-date; and
- Users have high emotional reaction to e-mail newsletters. As they arrive in users inbox, users have ongoing relation with them and at times, if found useful, users forward them to their colleagues or friends.

10.2.8 Bibliographical Control

Since, newsletters carry recent information and for immediate use, they lose currency very quickly and are normally not covered by indexing and abstracting services, which tend to cover material of permanent nature. This poses difficulty in identification and acquisition of newsletters. However, some database hosts, directories and websites serve as good guides for identification and acquisition of newsletters. Examples are "ARL Directory of Electronic Journals, Newsletters and Academic Discussion Lists", NEWJOUR (<http://www.gort.ucsd.edu/newjour>), The Scout Report

Self Check Exercise

1) What is an electronic newsletter? How is it better than print newsletter?

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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10.3 HOUSE JOURNALS

A house journal is a serial publication issued by an industrial, commercial, public service or a similar organisation to inform the public of its performance and style of functioning. It also serves as a medium to know the reaction and opinion of the public about its performance. For an organisation, the public consists of its employees, customers, dealers, retailers of its products, its shareholders, and the government that have social control over it. The house journal is a form of promotional literature, since it seeks to project and enhance the image of the parent organisation to its customers or employees or to advertise and promote the products and services of the organisation. The functions of the house journal are to:

- Improve business and industrial relations;
- Keep employees and customers in the picture;
- Serve as useful platform for communicating management's views;
- Promote and enhance the image of the management as well as of the organisation among its employees and customers; and
- Provide an objective news service.

10.3.1 History of House Journals

The origin of house journals can be traced back to Chinese Han Dynasty in 200 B.C. These were internal communications issued to keep the court informed. They became official gazettes in the seventeen century Tang Dynasty, and are the forerunners of today's house journals.

John H Patterson, President of National Cash Register Co., is acknowledged for establishing the first company-sponsored internal publication in the United States, the *NCR Factory News*, in 1887. It is still being published under the title of *NCR World*. Patterson was the first one to use the term "house organ" for his publication.

The first official external house journal was *The Travelers Record*, published in March 1, 1865 by Travelers Insurance Companies at Hartford, Connecticut. This publication is still continuing, though the name and contents have changed several times. This external

house journal, now published under the name "*Protection*", celebrated its 100th anniversary in 1965.

The United Planters Association of Southern India published the first house journal in India, the *Planters Chronicle* in 1905.

The house journal field has been expanding in three ways simultaneously - building circulations, adding pages and bringing out new publications for special interest groups of the sponsoring organisation. Presently, the house journals represent business, industry, labour union, university, college or fraternity, clubs, associations, religious organisations or other special interest groups.

10.3.2 Categories of House Journals

There are three broad categories of house journals - internal, external and combinations of both. Internal house journal is published for employees or members of the organisation, whereas external house journal is brought out for customers or potential customers of the organisation. Combination publications try to do both.

Internal House Journal

Internal house journal is brought out for the employees of the organisation and is meant for internal circulation. Its prime aim is to keep the employees of the organisation informed of the welfare measures and the concern of the organisation for its employees. It also aims at providing a forum for the employees to express their views including their grievances. Therefore, it serves as a forum for a two-way communication, thereby promoting the healthy growth of an organisation. The organisation also uses the internal house journal to stress the fact that the management is genuinely interested in the welfare of its employees.

External House Journal

The external house journals are designed for customers or potential customers of an organisation and are meant for external circulation. Based upon their contents, they can further be broadly grouped into three categories:

- i) The first category is that of a scholarly journal and can be equated in almost every respect with a standard technical journal;
- ii) The second category is the magazine. This contains general non-technical information and information about products of the organisation, without technical details.
- iii) The third category is the periodical catalogue, which is similar to a trade catalogue. The basic difference between this and the trade catalogue is, that the former is issued under the same title at regular intervals, just like a periodical publication.

10.3.3 Contents of a House Journal

The contents of the house journal vary with the type of house journal. For instance, the 'internal' house journal, which is produced for a company's personnel with the intention of creating a sense of community within its organisation, acts as a newspaper within the company. It carries news of social and sporting events, personnel changes, feature articles by employees, news of welfare measures, incentives, bonuses, etc. Internal house journals have little value as a source of technical information.

The external house journals based on their information contents, can further be broadly divided into three categories. The first category is that of 'prestige' publication and can be equated in almost every respect with a standard technical journal. These journals

contain technical articles giving an account of R&D work undertaken by company's employees. These journals promote the image of the company not by directly publicising its products and services but by associating the company with standards of excellence in frontiers of research related to its field. For example, IBM Journal of Research and Development and BHEL Journal of Bharat Heavy Electricals Ltd. published quarterly, BHEL Journal covers research articles, publishes news reports about company's innovations, gives an account of major achievements in company's various sectors of activities like power, industrial achievements, etc. and provides case history of successfully completed contracts or projects. The second category of external journal is like that of a magazine, which is meant for promoting the products of the company. This publication carries information about the products and services of the company without any technical details. The third category of external house journal is similar to a trade catalogue. This publication provides descriptive accounts of company's newly launched products, processes, materials or services.

10.3.4 Characteristics of House Journals

The common characteristics of house journals are as follows:

- They are produced by the sponsoring organisation for enhancing the image of the organisation and for promoting its products and services;
- They are usually distributed free to the employees and potential customers;
- Financial support is provided through budget allocation by the sponsoring organisation;
- They carry no advertisements except that of the sponsoring organisation; and
- They are printed on good quality art paper and are usually colourful and attractive.

10.3.5 Bibliographical Control

The house journals can be a useful source of technical information but their value is generally not appreciated. In a survey of house journal usage and storage made by Isabel I Harberer (1967), it was reported that 'overall there was found to be general neglect for acquiring and processing of even the most informative house journals.' The librarians very closely identify their image as a promotional material. The other problems associated with the bibliographical control of house journals are their lack of standardisation and irregularity in publication. However, many of the technical house journals reporting research work are covered by the major indexing and abstracting services.

Self Check Exercise

- 2) Distinguish between external house journal and internal house journal explaining the purpose of each.

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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10.4 TRADE AND PRODUCT BULLETINS

Trade and product bulletins are information products brought out by the publishers, manufacturers and distributors of various types of materials, products or services. The trade and product bulletins virtually cover every kind of material, product or service ranging from books, drugs, chemicals, household goods to extremely complicated machinery and equipment used in research and industry. The basic purpose of this type of trade literature is to describe various attributes of the product, material or service and promote its sale to the potential customers. They are also known as trade catalogues.

10.4.1 History of Trade Catalogues

The earliest trade catalogues were book lists distributed by booksellers. A catalogue of books issued in 1564 by George Willer, an Ausburg bookseller is believed to be the first such catalogue. This was a subject list of 256 books. Following this, booksellers in England and other European countries also started issuing book catalogues. This was followed by drug catalogues issued by chemists and druggists. The first American drug catalogue was issued in 1760 by John Tweedy of Newport and second by John Day and Company in 1771. During the 1780s metal manufacturers of Birmingham and Sheffield published illustrated catalogues of their products and sent to the agents in France, Italy, America, and perhaps to India and Russia. In earlier British trade catalogues, the manufacturer's name was not provided, so that the customers were forced to purchase the items through agents. Whereas American trade catalogues provided the manufacturer's name to facilitate direct ordering of goods from the manufacturer. With the growth of industry the number and range of trade catalogues also increased tremendously. Lawrence B. Romaine's *A Guide to American Trade Catalogs, 1744-1900*, is an annotated guide to early American trade catalogues.

10.4.2 Characteristics of Trade and Product Bulletins

There is a considerable variety in format, size, type and amount of information presented in trade and product bulletins. It may range from a small advertisement in a periodical or a leaflet announcing a single product to a multivolume publication describing thousands of products of a single manufacturer or a large number of manufacturers. Some product advertisements appear just like a magazine article and editors often label them as "Advertisement" to distinguish them from the feature articles. For example, some of the advertisements appearing in Reader's Digest magazine.

Some of the general characteristics of trade and product bulletins are as follows:

- They generally contain application oriented descriptive information and do not provide theoretical details of the research leading to the development of the product with the exception of trade literature describing medicines and complex scientific equipment. A brief account of the relevant background research, supported by charts, diagrams, equations, and literature references is often provided in trade and product bulletins of medicinal products or scientific instruments.
- Trade bulletins are primary sources in which information about a product or process appears prior to its publication in any other form of literature. In fact, much of the information reported about specific commercial product is not likely to be published in any other form of literature.
- Much of the information presented in these bulletins lose currency very quickly, because new products and processes are constantly being developed and improvements are made to the existing ones.
- These publications are usually distributed free.

- Trade catalogues issued by manufacturers are undated.
- The amount of information provided for products or processes vary considerably ranging from mere announcement to detailed description of the product or process.

The type of information usually covered is as follows:

- historical overview of the company;
- background research leading to the development of the product;
- product description, application, operating characteristics, etc;
- installation, operation and maintenance details;
- illustrations, including photographs, layout plan, and circuit diagram, etc;
- names, addresses of the agents and distributors;
- letters of recommendations or testimonials from the satisfied customers; and
- price of the product is usually not included.

10.4.3 Functions of Trade and Product Bulletins

Trade and product bulletins are primarily published to promote sale but they serve as indispensable source of information for specialised group of users such as scientists, engineers, technologists, chemists, medical practitioners, etc.

Trade and Product Bulletins:

- Provide latest information about industrial products and help the technologists to ascertain whether a particular machinery or a component of a machine or a specific product is available in the market or not.
- Help the technologists to compare similar products available from various manufacturers and select the most appropriate one.
- Provide easy access to names and addresses of the manufacturers, distributors of industrial products.
- Serve as important communication channel between manufacturers, dealers and buyers.
- Articles published in these bulletins are broader in appeal with colourful illustrations, charts and diagrams.
- Back runs of these publications serve as an important source of information for the study of industrial archeology, business history, and history of technology.

10.4.4 Sources of Trade Literature

Trade literature is available in wide range of sources. The basic sources are as follows:

- 1) Advertisements and announcements in technical journals and trade magazines.
- 2) Special issues and supplements of journals.
- 3) Manufacturers' catalogues, house journals and newsletters.
- 4) Product descriptions supplied at trade exhibitions.
- 5) Directories of industries, products and companies.
- 6) Companies' websites and trade portals on the Internet.

Advertisements and Announcements in Technical Journals and Trade Magazines

Most fields of industry and technology are covered by at least one commercial technical or trade journal. These publications aim to cater for information needs of industry for repackaging information gleaned from other primary sources, in an easily digestible form for the management and practitioners alike. The journal's main functions are to report new techniques and products within the industry and report on new techniques developed outside the industry, which are of potential interest to the readerships. Most of these journals carry product advertisements. The major portion of the financial income of these journals is not derived from subscription but from the revenue from the manufacturers whose products and services are advertised in the journal. Almost each issue has an advertisers' index. Some of the trade journals are totally devoted to products' advertisements. Their main function is to advertise new industrial product, process or material. For example, journals like Chemical Product Finder, Industrial Product Finder, and Industrial Equipment News, etc.

Chemical Product Finder, published monthly by Jasubhai Media Pvt. Ltd., Mumbai, is a journal of materials and equipment for chemical process and allied industries. It carries profiles of latest products; plant and equipment, process, material and services launched by chemical process and allied industries in India and abroad.

Industrial Equipment News, published monthly by Sri Balaji Publishing Co. Pvt. Ltd., Mumbai, is an industrial product news magazine. It brings out special issues on particular type of industry and covers write up on all products of that industry with illustrations. Each issue contains a section on 'Company Profile'.

Industrial Product Finder, published monthly by Business Press, Mumbai, is an industrial product news magazine. It carries profiles of new industrial products, devices or services manufactured in India. The publication also carries information about the new industrial products developed abroad and available for Indian market. Products are listed trade and utility wise. From May 1997, the publishers have launched trade portal for the industrial products on the website (<http://www.industrialproductfinder.com>).

Special Issues and Supplements of Journals

Many technical journals publish an annual issue or a supplement, usually called 'Buyer's guide' or 'Directory Issue'. Annual buyer's guide issued by a) Chemical Engineering, b) Electronics For You, c) Chemical Week, d) Machinery, e) Nuclear News are typical examples.

Manufactures' Catalogues

Catalogues, published by manufacturers, contain substantial technical data on company's products and their applications. These catalogues range from a single sheet of paper with technical description of one product to a bound volume containing detailed description and technical data of all the products of a company. These catalogues are supplied directly to the prospective customers by the manufacturers, their representatives or agents.

Product Descriptions Supplied at Trade Fairs, Conventions, Exhibitions, etc.

Manufacturers exhibit their products and distribute catalogue at conferences and conventions organised by professional societies. Trade catalogues are also issued at

Directories of Products and Companies

These are independent publications containing data on a number of companies and their products in any one branch of science, engineering or technology. *World Aviation Directory*, published semiannually by Ziff-Davis publishing Company, New York, is an international directory of air carriers, manufacturers of aircrafts and related equipment, government agencies and other organisations concerned with aviation in over 160 countries. Books and other publications on aviation and aerospace technology are also listed. The 'Buyers' Guide section has a company index, a product cross-index and a trade name index. Other such directories are Kompass International Register Editions and Thomas Global Register.

Kompass International Register Editions: Each edition published for over 70 countries provides corporate profiles, products and services of different types of industries. The four volume Kompass U.K. provides corporate profiles of 46,000 companies classified under 41,000 products and service categories. It covers company information, products and services, financial data, parents and subsidiaries and industrial trade names.

Thomas Global Register is a directory of 600,000 manufactures and distributors from 28 countries. Manufacturers are classified under 11,000 products and service categories in 11 languages. Thomas Register of Indian Manufactures is a directory listing 42,000 Indian manufacturers and industrial service providers, classified by 10,000 products and services categories. The directory is available in print and on CD-ROM as an annual publication.

Companies' Websites and Trade Portals on the Internet

Most of the medium to large-scale Indian industries have their websites on the Internet, as web presence on the Internet, provide them cost effective opportunity to reach their customers world wide. These companies have their products catalogue online, providing latest information on their products and services. The web presence has many other advantages too, like it serves as virtual office open 24 hours of the day, buyers can see product images and their descriptions and can send business queries online through 'online query form' directly to the manufacturers.

Presently, Internet has become an important medium of trade, for trading all range of products including industrial products, equipment and materials. A large number of business to business portals, commonly known as B2B portals, offering trade related information to the business community and general customers in India and abroad, have sprung up.

For example, TradePortalofIndia.Com (<http://www.tradeportalofindia.com>), IndiaTrade.com (<http://www.indiatrader.com>), IndiaMart.com (<http://www.indiamart.com>), SeekandSource.com(<http://www.seekandsource.com>), etc. These trade portals offer wide range of business promotion services to the manufacturers, such as building business homepage for the company, supporting business homepage on their server, promoting company's website on the industry specific search engines, advertising company's products and services through e-catalogues, supporting Business to Business auctions, etc.

<http://www.tradeportalofindia.com>: This is a trade portal of India, setup by Business Information Centre of India Trade Promotion Organisation (ITPO). The website provides products/suppliers profiles from India. It has a global importers directory with over 40,000 importers profiles, overseas market analysis, trade and investment regulations and listing of major trade fairs of the world. The site provides links to other trade related sites such as Export Promotion Council, Chamber of Commerce, Industry Associations; International Trade and Trade Related Organisations, etc.

<http://www.indiamart.com>: Operational since 1996, India mart is a B2B online trade portal with 5000+ clients and 25 nation wide hubs. It has a database with 60,000 companies under 450 products and services categories. IndiaMART provides online business solutions through its network of online directories, marketplaces (Trade offers, B2B auctions, industry portals) and other B2B services (Newsletters, Discussion Boards, Building Business homepage, etc.). The product category ranges from household goods to industrial products from agro, auto, jute, pharmaceutical and other industries.

<http://www.seekandsource.com>: Supported by Sify Limited, SeekandSource.com is cross-industry, e-community portal and B2B e-Market place for buying and selling industrial goods and business services. This trade portal has 40,000 small and medium Indian businesses comprising manufacturers, suppliers, exporters and service providers across 89 industry segments covering engineering, automotive, electrical machinery and equipment, chemicals, plastics, computer hardware, IT products and others.

<http://www.industrialproductsfinder.com>: It is a trade portal from the publishers of Industrial Product Finder (IPF) journal, for people in industries/business to interact, participate and buy and sell industrial products. The portal provides to its users four platforms that can be used for industry/business visitors to exhibit their products as well as company details effectively and also to source information suited to their work environment. These platforms are: a) E-product catalogue, b) Industrial storefronts, c) Industrial products profiles, and d) IPF advertisements on the portal. E-product catalogue can be searched by product name, industry name or by product category. Industrial storehouse includes company's profile, description of two industrial products and a link to the company's website. Industrial products profiles provides profiles of more than 23,000 industrial products used in a wide range of manufacturing industries.

10.4.5 Bibliographical Control

Most of the trade literature, such as trade catalogues, trade journals, etc. are considered ephemeral material that become obsolete very quickly and therefore, is not covered by the indexing and abstracting services. These publications are also not systematically acquired and organised by libraries. Many trade catalogues are routinely mailed by the manufacturers free to technical libraries. These are usually filed in vertical files or pamphlet boxes, alphabetically by manufacturer's name in the libraries. However, constant weeding out is required to keep the collection current. Most of the librarians prefer to maintain a collection of trade and business directories for reference purposes than trade and product catalogues.

Self Check Exercise

3) What are the functions of trade and product bulletins?

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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10.5 SUMMARY

This Unit describes information products like newsletters, house journals and trade and product bulletins issued by industrial, commercial, public service, or similar organisations, as promotional material for the target audience. It also describes briefly, history, functions, types and characteristics of newsletters, house journals and trade and product bulletins. This Unit points out how advances in computers and telecommunication technologies have changed the communication pattern of industrial and commercial organisations. It briefly explains how these organisations are promoting themselves through electronic information products like e-newsletter, business homepage and e-commerce.

10.6 ANSWERS TO SELF CHECK EXERCISES

- 1) Newsletters published and distributed electronically over the computer networks are known as electronic newsletters. E-newsletters started appearing in 1990s and have proliferated since then. These are distributed by e-mail to people who voluntarily subscribe to them online. Electronic newsletters are better than print newsletters because they are speedily delivered, are cost effective and better targeted than their print versions. As they arrive in user's inbox, users have ongoing relation with them. If the contents of e-newsletters are found useful, users forward them to their colleagues and friends, which is not possible with print newsletters.
- 2) Internal house journal is brought out for the employees of the organisation and is meant for internal circulation. Its prime aim is to keep the employees of the organisation informed of the welfare measures and the concern of the organisation for its employees. It also aims to provide a forum for the employees to express their views including their grievances. Therefore, it serves as a forum for two-way communication, thereby promoting the healthy growth of an organisation. The organisation also uses the internal house journal to stress the fact that the management is genuinely interested in the welfare of its employees. External house journals are designed for customers and potential customers of an organisation and are meant for external circulation. The external house journal keeps the external public informed of the organisation, its products, activities and programmes. The basic purpose of the external house journal is to enhance the image of the organisation and promote its products and services.
- 3) Trade and product bulletins are primarily published to promote the sale but they serve as indispensable source of information for specialised group of users such as scientists, engineers, technologists, chemists, medical practitioners as these publications:
 - a) Provide latest information about industrial products and help the technologists to ascertain whether particular machinery or a component of a machine or a specific product is available in the market or not;
 - b) Help the technologists to compare similar products available from various manufacturers and select the most appropriate one;
 - c) Provide easy access to names and addresses of the manufacturers, distributors of industrial products;
 - d) Serve as important communication channel between manufacturers, dealers and buyers;
 - e) Articles published in these bulletins are broader in appeal with colourful illustrations, charts and diagrams;
 - f) Back runs of these publications serve as an important source of information for the study of industrial archeology, business history, and history of technology.

10.7 KEYWORDS

- Bulletin** :
- i) A publication, generally a pamphlet, issued by a government, society or other organisation at regular intervals and in serial form.
 - ii) A periodical or occasional publication containing lists of books added to a library, and other library information.
- Company Profile** :
- i) A biographical account of a particular company combined with a description and assessment of its achievement.
 - ii) (In the context of Information Retrieval) A set of indexing terms, which characterise the interests of a particular company using a selective dissemination of information service.
- Electronic Newsletter** :
- An online document which contains information about the recent and ongoing activities of an organisation.
- External House Journal** :
- The house journal meant for the external public like the shareholders, customers, etc.
- House Journal** :
- A periodical produced by a commercial or industrial organisation, either for internal distribution amongst the staff and employees or externally to its customers.
- Internal House Journal** :
- The house journal meant for internal public namely the employees.
- Newsletters** :
- Newsletters are publications issued by organisations, often simple in format and crisp in style, they provide speedy information for a definite public (audience).
- Pamphlet** :
- A non-periodical publication of at least five but not more than 49 pages, exclusive of the cover pages. (General Conference of Unesco, 1964).
- Trade Catalogue** :
- A publication containing particulars of goods manufactured by, or sold by, a firm frequently illustrated and containing prices.

10.8 REFERENCES AND FURTHER READING

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UNIT 11 INFORMATION PRODUCTS – PART-II

Structure

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Reviews and Related Publications
 - 11.2.1 Characteristics
 - 11.2.2 Preparation
 - 11.2.3 Types and Functions
 - 11.2.4 Examples
- 11.3 State-of-the-Art Reports
 - 11.3.1 State-of-the-Art of a Technology
 - 11.3.2 Market Reports
- 11.4 Statistical Reviews
 - 11.4.1 Methods of Evaluation
- 11.5 Trend Reports
 - 11.5.1 Need
 - 11.5.2 Preparation
 - 11.5.3 Examples
- 11.6 Technical Digests
 - 11.6.1 Definition and Meaning
 - 11.6.2 Need and Functions
 - 11.6.3 Categories
 - 11.6.4 Planning and Preparation
 - 11.6.5 Examples
- 11.7 Summary
- 11.8 Answers to Self Check Exercises
- 11.9 Keywords
- 11.10 References and Further Reading

11.0 OBJECTIVES

After reading this Unit, you will be able to:

- define information consolidation;
- explain the values and benefits associated with consolidation of information and know various Information Analysis and Consolidation (IAC) products resulting from information consolidation activities;
- describe the need for, characteristics and functions of IAC products such as Reviews, State-of-the-Art Reports, Trend Reports and Technical Digests;

- understand the basic processes involved in the preparation of these products;
- service these products effectively to the target audience; and
- evaluate these products.

11.1 INTRODUCTION

Access to scientific, technical, and commercial and health related information is crucial for the success of any individual and for the growth and development of any nation leading to alleviation of poverty, protection of environment and sustainable development. However, most of the existing literature in science, technology, health, business, education and related fields is written by experts for experts and cannot be effectively used by non-experts or potential users directly in its original form. In other words information is not presented in the language and form that is understandable, readable and acceptable to potential users who may benefit from it. Another problem in the effective utilisation of information is overabundance of information on a topic. The sheer amount of information on any topic requires too much time and effort on the part of a user to select the required information, which a busy user cannot spare. Therefore, information users at different levels require appropriate information, which they can easily comprehend, assimilate and make use of with a certain degree of confidence and reliability within the framework of their working environment. The users require information packaged in a form, which they can use it immediately. In other words, users at different levels require consolidated information.

“Consolidated information is ‘public knowledge’ specially selected, analysed, evaluated and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems and immediate needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in a great amounts of documents or in its original form. The criteria for selection, evaluation, restructuring, and repackaging of this knowledge are derived from the potential clientele.” (Saracevic and Wood, 1981). Consolidated information aims at being more appropriate to users, their needs and levels, the capacities and time allotments given to information absorption and similar user related activities. In other words consolidation and repackaging of information refers to providing right information for the right person in the right form and at the right time.

Value and Benefits of Information Consolidation

Value in decision-making and problem solving

As the amount of information presented to the decision maker is increasingly consolidated, its value increases. For instance a summary has a bit more value in comparison to the original document. Merger of excerpts from a number of documents may have still more value. Evaluated information further increases the value while studies addressing the topic such as reviews, state-of-the art, market studies, statistical summaries and correlations, increase this value considerably. Most valued information which provides alternative choices summarised from all sources and make recommendations for decisions or for resolution of the problem.

User Benefits

- As information is increasingly expressed in everyday language and the social and cultural framework of the user, its value increases for that user.
- As the information is increasingly packaged in a way that will make its use easier, its value increases.

These relations can be expressed diagrammatically as shown in Fig. 11.1.

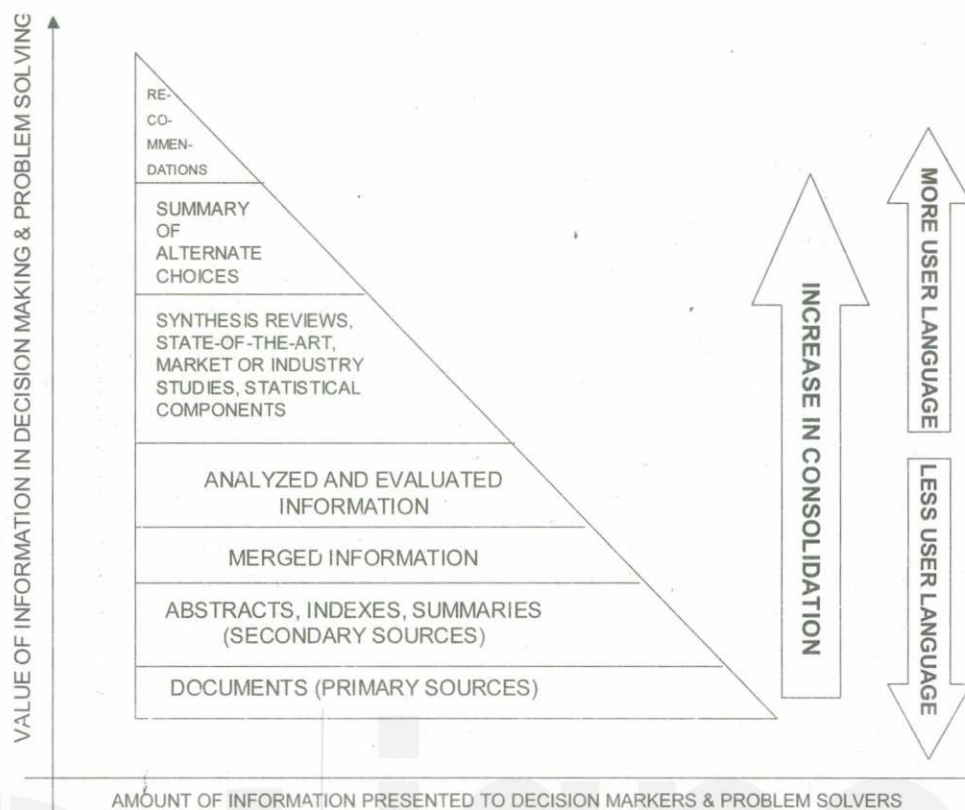


Fig. 11.1: Value of Information in Decision Making and Problem Solving

(Source: Tefko Saracevic (1986))

The evolution of the concept of information consolidation, basic objectives and processes involved in information consolidation, methodology to be followed in the preparation of IAC (Information Analysis and Consolidation) products have been dealt in detail in Unit 4- “Information Analysis and Consolidation Centers” of this course.

In this Unit you will study about IAC Products like Reviews, State-of-the-Art Reports, Trend Reports and Technical Digests.

Self Check Exercise

- 1) What do you understand by consolidated information? Explain the values and benefits associated with consolidation of information.

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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11.2 REVIEWS AND RELATED PUBLICATIONS

As you are aware, the primary literature in any discipline consists of ever increasing volume of journal articles, reports, dissertations, conference papers and other form of primary literature published in different languages and form, scattered across the world. Abstracting and indexing services, catalogues and bibliographies provide bibliographical

control of the primary literature by systematically indexing or summarising (in abstracting services) items published in primary sources and arranging them in a helpful order for identification and location of individual items. It has been observed that the volume of indexing and abstracting services have been growing with the growth of primary literature. Even to scan the literature of a subject through these devices is also becoming difficult. Moreover, in these services, each item with full bibliographical details stands separate, disjointed from other items, except it is placed along with other similar items, through subject grouping or system of classification. These publications do not provide a coherent picture of the overall development or a progress of a subject. What actually required is not only a coherent picture of the overall development or the progress of a subject, but also presentation of the primary literature in a more digestible form. This purpose is achieved by reviews. A review may be defined as “narrative account of the progress of a particular field of study, prepared by an expert in the field” (B.Guha). Reviews may be considered as critical synthesis of the state of knowledge in a given subject or its sub-discipline.

11.2.1 Characteristics

There are three essential characteristics that are more or less applicable to most reviews. These are: i) integration, ii) evaluation, and iii) compaction of primary literature. Unlike an annotated bibliography or an abstracting journal, a review article places each of the articles reviewed in a context and integrate them with existing corpus of knowledge in that field. Some degree of evaluation is an essential characteristic of a review. Some reviews (e.g. the critical reviews) are primarily and explicitly evaluative in nature, others (e.g. a descriptive review) only indirectly involve some degree of evaluation. Compaction is an important feature of a review. This can be estimated by determining: i) the average number of references cited per page of text in the review, or ii) the ratio of the number of pages of primary documents to the number of pages in the review document. The degree of compaction varies from field to field and within a given field, between review articles and long treatises. As, a review sifts, evaluates and puts each significant contribution into its proper perspective, the large amount of primary literature is eliminated and only significant contributions with full bibliographical details are brought to the attention of the reader. Since, information conveyed by the reviews is evaluated, assessed and related to general body of knowledge by a third person, reviews are found to be more effective in transfer of ideas and knowledge than the research paper. No original research is reported in reviews. Reviews are secondary sources of information, because they are based on other publications that contain primary information. Of various information products, reviews occupy a most significant place. They are often considered the highest level of intellectual reprocessing of information. Reviews in the present context are ‘critical’, ‘evaluative’ reviews and not just a summary, an annotated bibliography, a fact report or a book review.

11.2.2 Preparation

A review may be a one-time or occasional publication, or it may be periodical review published at regular or irregular intervals. Based on the intended readership, review may be written for subject specialists, students or general readers. Reviews range from a short review article published in a journal to a review monograph or a multivolume publication in which chapters or volumes are written by different authors.

The methodology for preparation of reviews is essentially the same as is used in preparation of information consolidation product i.e. : i) Study of the potential users, ii) Selection of information sources, iii) Evaluation of information, iv) Analysis and synthesis of information. During analysis most salient features conveyed by the given source are identified and extracted. During synthesis, the analysed information from

one or more sources is condensed and presented in a new arrangement or structure with an interpretive or evaluative point of view. v) Restructuring (if necessary) the extracted information into content that can be effectively utilised by the users, and vi) packaging and/or repackaging of structured information for the target audience. Preparation of reviews is an intellectually challenging task. It involves assembling, digesting, and evaluating scattered primary documents and condensing their contents into coherent and comprehensive packages. Authors of reviews should be experts in their own disciplines. The qualifications of an ideal author are enumerated by Caudra (1966) in his introduction to the first volume of the Annual Review of Information Science and Technology, which are as follows:

- 1) He must have a strong grasp and thorough knowledge of the subject so as to understand and put each significant contribution in its proper perspective.
- 2) He must have established a habit of keeping himself informed by reading reports, published literature and by making regular contacts with specialists in his subject fields.
- 3) He should be a competent writer and able to make objective judgement about the merit and implications of reported research work.
- 4) He must have sufficient prestige in the field to invite reader's respectful attention to his contribution.
- 5) He must be willing to do an immense amount of sifting, reading and evaluation on an extremely tight schedule.

11.2.3 Types and Functions

In general, two types of reviews can be distinguished:

- i) Bibliographic; and
- ii) Instructional.

First category of reviews concentrate on selecting and evaluating primary literature published on a subject or a topic within a specified period of time (e.g. annually, biannually or five yearly, etc.). The second categories of reviews, concentrate on particular scientific or technical problem, and provide its solution. Many reviews combine the bibliographic and instructional role into one; the proportion varies according to the aim and audience of the review.

Reviews perform two major functions:

- i) Historical or subject related functions; and
- ii) Contemporary or user related functions.

Historical functions relate to the development of a subject or a topic. These functions are as follows:

- 1) Expert's evaluation of the published literature and selecting those items, which are worth saving in literature.
- 2) Collation of information from various sources and putting them in proper perspective.
- 3) Compaction of existing knowledge i.e. extracting new information only from various sources and leaving out other details like methodology, discussion or already known information.

- 4) Replacement of many scattered documents with one. At times replacing the primary documents as the written record.
- 5) Direction for further research. Reviews by critically examining the state-of-the-art in a subject or a topic, suggest areas for further research.
- 6) Identification of emerging discipline. Reviews by bringing together various works may identify emergence of new area.

Contemporary or user related functions of reviews, are functions which are beneficial to individual user. These functions are as follows:

- 1) **Current Awareness Function:** Helps individuals to keep abreast of current developments in their own subject field or adjacent subject field without having to go through mass of literature published in primary sources.
- 2) **Informed Notification Function:** In reviews most significant contributions with full bibliographical details are brought to the notice of the individuals.
- 3) **Back up for other Literature Searching:** Reviews with extensive bibliography, serve as a starting point for more current literature not yet covered in reviews.
- 4) **Tutorial Function:** Reviews are useful to students in understanding new subjects and to specialists and researchers in continuing education and in obtaining an overview of a subject outside their field of specialisation.
- 5) **Inspiration:** Reviews provide ideas and suggestions for further research work.
- 6) **Feedback:** Reviews provide a measure of a researcher's own published work, as each primary document is evaluated and selected by an expert for including in the review.
- 7) **Promote Cross Fertilisation of Ideas:** Reviews in a specialist's adjacent areas of research helps in cross fertilisation of ideas and promote research in new areas.

A number of users' surveys have revealed that there is an increasing demand for 'critical' and carefully edited reviews. Such reviews are extensively used by the scientific community. For instance, of 5907 journals assessed by impact factor, in ISI Journal Citation Report in the year 2003, Annual Review of Immunology ranked no.1 and Annual Review of Biochemistry ranked no.2., and more than half of the Annual Reviews titles were in the top 100 regardless of the category. (<http://www.annualreviews.org>)

11.2.4 Examples

Annual Reviews: These are 'critical' and 'state-of-the-art' reviews published annually in book form on a broader subject, consisting of a number of review articles on its sub-disciplines written by experts on the subject. These reviews are meant for the specialists. For example, reviews published by Annual Reviews Inc., a leading publisher of annual reviews. The publisher publishes authoritative, analytic reviews in 30 focused disciplines within Biomedical, Physical and Social Sciences fields. Annual Reviews Inc. offers its publications in print and online to individuals, institutions and consortia throughout the world. Some of the examples are *Annual Reviews of Biochemistry*; *Annual Review of Clinical Psychology*; *Annual Review of Immunology*; *Annual Review of Biomedical Engineering*; *Annual Review of Astronomy and Astrophysics*, etc.

Annual reviews are also published by learned societies e.g. *Annual Review of Information Science and Technology*, published by American Society for Information Science.

Advances Type: 'critical' and 'state-of-the-art' reviews published in a book form, but published less regularly, like once in two or three years e.g. *Advances in Virus Research*, *Advances in Solid State Physics*, *Advances in Protein Chemistry*, *Advances in Polymer Sciences*, etc.

Journal Type: A periodical published monthly or quarterly by a learned society devoted to publishing critical reviews, e.g. *Chemical Reviews*.

Popular Journals: Generally broad in scope, providing popular review articles in topical areas aimed at non-specialists, e.g. *Scientific American*, *Science Reporter*, *Science Today*, etc.

Essay Type: Generally containing tutorial types of reviews aimed at broader audience than the subject specialist particularly students and teachers e.g. RT Image publishing 'Essays in Radiology'.

Self Check Exercise

2) Explain major functions performed by reviews.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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11.3 STATE-OF-THE-ART REPORTS

These are the types of reviews which do not have an all encompassing scope and historical orientation, as is depicted in traditional 'critical' reviews. Their basic aim is to describe current and up-to-date status of a situation, which may be of a technology, use of a technology or impact of a technology, etc. Such types of objective reports are timelier than the traditional reviews and mainly serve as a current awareness tool. With a view to achieve this currency, state-of-the-art reports are often published as informal reports, prepared on demand, oriented towards a restricted audience and are sold at high prices. These reports become obsolete very fast.

The state-of-the-art reports are mostly prepared on technological topics and in the fields of business and commerce.

11.3.1 State-of-the-Art of a Technology

These types of report summarise, compare, and evaluate the advances, characteristics and/or utilisation of a given technology or technological product or a process. The scope and emphasis differ according to the intended use and the users. These reports generally highlight the following aspects of a technology:

Technical and Engineering aspects: Oriented towards technical personnel and engineers in particular. These reports provide technical details of the new technology. Such reports are useful in technology design, for making purchase recommendations,

for comparison of purposes with another alternative technology and for keeping up-to-date with technology.

Use aspects: Oriented towards users of a technology. Such reports concentrate on characteristics, requirements and economics of use of a given technology. It covers aspects such as comparative reliability, durability, operating conditions, etc. of a given technology.

Management aspects: Oriented towards policy makers on a higher level, such as government officials, planners, special delegations and, for the officials releasing funds for the given technology. Such reports highlight the impact (social, environmental, economic, etc.), strategic requirements, political considerations, international aspects, experiences of other countries in the use of technology under similar situations, etc.

Examples

TRB (Transportation Research Board) State-of-the-Art Report 9: Utilities and Roadside Safety.

TRB State-of-the-Art Report 8: Guide to Earth Work Construction.

TRB State-of-the-Art Report 5: Lime Stabilization.

State-of-the-Art Report on technology for the efficient management of geo-spatial 3D data on commodity and distributed platform. EU Project. V-PLANET (IST-2000-28095). March 2002.

Information technologies: State-of-the-Art and imperatives for India. Vol. II, New Delhi: TIFAC, Department of Science and Technology, 1993.

11.3.2 Market Reports

These reports usually present the state of an industry or a market in terms of its existence, financial strength, economics, profitability, deployment, growth, characteristics, gaps, trends, potential, etc. Like technological state-of-the-art reports, these reports can also be oriented towards different uses and clientele.

Examples

The U.S. Environmental Industry and Global Market Report. 2000.

EBI Environmental Market Report. Environmental Business International Inc.

11.4 STATISTICAL REVIEWS

These reviews present statistical correlations in a wide variety of technical, market, demographic, scientific and other areas. Such reviews are specifically composed and evaluated to show cross-dependence of trends, situations and results. These reviews may accompany any of the above mentioned state-of-the-art reports or issued as independent publications. These statistical reports are usually used for briefing of decision makers.

11.4.1 Methods of Evaluation

Evaluation involves determination of the intrinsic merit, validity and reliability of information sources, which are selected for consolidation, as well as evaluation of IAC product itself. A single set of criteria for selection of sources for information consolidation to cover all kinds of products for all kinds of users cannot be specified. Different IAC products with different objectives require different criteria. However, generally recognised criteria used in estimating the merits of a scholarly publication, can be used here for selection of information sources for information consolidation as well as evaluation of IAC products. These criteria are:

- Selecting peer reviewed publications; and
- User evaluation of information services.

Criteria in peer review of publications in science and technology have long been used to judge meritorious work and reject work of little or no merit. These criteria can be adapted for selection of S&T sources for information consolidation.

The other criteria are user evaluation of information services. These criteria can be adopted for selection and evaluation of already existing information consolidation products. Various user studies have shown that there are five general classes of criteria used by the users for evaluating information services. These are as follows:

- 1) **Quality of Information**, including
 - Precision and accuracy of information.
 - Credibility of the sources.
 - Recency of information.
- 2) **Scope of the Service/Product**, including
 - Completeness of information.
 - Comprehensiveness of subject or topic coverage.
- 3) **Appropriateness of Information**, including
 - Meeting the information needs.
 - Solving the information overload problem.
 - Fitting with users' own capabilities in terms of language, sophistication level.
 - Degree of opinions, extraneous, irrelevant information in the service/product.
- 4) **Ease of Access of Service/Product**, including
 - Time lag in receiving the service.
 - Ease of usage of received information i.e., format of the service/product.
 - Efforts required getting a response.
 - Support provided in access and use of service/product..
- 5) **Cost of the Service/Product**, including
 - Direct cost of obtaining the service.
 - Indirect cost in accessing and using the service and in post-processing of information.
 - Apart from the above-mentioned general criteria for evaluation, specific criteria are necessary to be applied for evaluating reviews because of their dual, historic and instructional functions. These criteria are as follows:
 - **Completeness:** The degree to which both the subject and literature on the subject are covered.
 - **Perspective:** The degree of appropriateness in relation to both, a given subject and for a given audience.
 - **Analysis:** The Thoroughness, depth and breadth of analysis; Degree of collation of information from different sources; and degree of evaluation applied to analysis.

- **Synthesis:** The degree of compaction and relations drawn; Extent of replacement of previous information and literature on the subject; and the Degree of evaluation applied in synthesis.
- **Value added:** Identification of emerging specialties; Introduction of new hypotheses or theories; and Suggestions for future work, etc.
- **Utility:** The degree to which a review can serve multiple functions as mentioned above.

Self Check Exercise

3) Enumerate the specific criteria to be used for evaluating reviews.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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11.5 TREND REPORTS

Trend reports provide systematic view of recent developments and current research trends in a subject field: The purpose of the trend reports is to briefly capture the major trends in a given area of research based on the analysis of literature on the given subject published during a specific period of time, ranging from two years to five years or more. Trend reports are highly useful IAC product for subject specialists and decision makers. These reports also provide a starting point for students and research workers helping them to identify and embark on a new area of research. According to Gopinath "A Trend Report is an exposition of a subject, giving an account of the general direction of research in the subject, based on a review of the documents on current developments. The trend report service is designed to help the specialist reader in the productive utilisation of his time and in the conservation of research potential. The training of a documentalists equips him to do this service satisfactorily. However, the specialists' cooperation is necessary."

11.5.1 Need

Trend reports provide an overview of the current developments and research trends in a particular subject field. Trend reports help:

- researchers to keep themselves abreast of latest developments in a particular subject field, identify new areas of research and utilise their time and effort more productively towards research;
- planners and decision makers and funding agencies to sponsor a research; and
- students to identify an area of research.

11.5.2 Preparation

Until recently the trend report was prepared by the subject specialists. Preparation of trend report is a time consuming and tedious process. It involves arduous task of identifying and physically acquiring all the documents to be considered for the report

writing, spending a great deal of time and effort in reading, sifting, evaluating and selecting the items for inclusion and then writing the report. Writing the report, in terms of intellectual effort, is no less challenging than the original research. However, it is observed that S&T personnel engaged in active research consider writing of trend report, less rewarding than the original research. This has led, the specialised information centres to take up this task. Library and information science discipline has developed powerful techniques to analyse a subject in great depth and represent it in a form to bring out the appropriate strength and relation between different components of a subject in a helpful way. An information specialist with adequate subject and professional knowledge (Master's degree in the subject discipline as well as in library and information science field), is able to view the subject in proper perspective – in perspective of the development of a subject in the past, present and in near future. It has been found that the same guiding principles, used in the analysis of a subject and its expressive representation, are helpful in the presentation of the ideas in a helpful sequence in the text of a document like a book, an article in a periodical or a technical report. Thus, an information specialist can equip himself/herself with the necessary techniques to prepare a trend report, thereby, relieving specialists from this arduous task. The information specialist should possess the following qualifications for the preparation of a trend report:

- He/She should be familiar with different components of a subject;
- He/She should know different sources of information on the concerned subject;
- He/She should have proper rapport with the specialist user to find out subject approach and views on the subject;
- He/She should have knowledge of the exact subject requirement of the specialist; and
- He/She should be familiar with the methods of compiling a trend report.

The work involved in the preparation of trend report can be demarcated into three planes of work namely:

- i) The Idea Plane
- ii) The Verbal Plane
- iii) The Notational Plane

The work in **Idea Plane** involves:

- precise specification of the subject, depth and period of coverage including types of documents to be covered;
- collection of relevant information sources;
- appraisal of information sources;
- identification and extraction of most salient features conveyed by information sources;
- arrangement of extracted information into a helpful sequence; and
- integration of the extracted information into an organised text.

The work in the **Verbal Plane** involves:

- use of homonym-free and synonym-free terminology; and
- other factors associated with the expression of ideas in a language.

The work in the **Notational Plane** involves:

- preserving the helpful sequence of ideas arrived at in the Idea Plane and for this purpose;
- formulation and use of a notational system in structuring the text.

However, the best possible sequence is dependent on the users for whom the product is meant. The text and the language used should be oriented to the intellectual level, comprehension and requirement of the users concerned.

A trend report as a final product contains:

- Title page;
- Content page;
- Short informative abstract;
- Body of the text, chapter wise;
- Expressive index;
- Bibliography of references; and
- An appendix, with definition of the technical terms.

11.5.3 Examples

Trends in Tuberculosis -United States, 1998-2003. Division of Tuberculosis Elimination, National Centre for HIV, STD and TB Prevention.

Eisenberg, Michael B. (et al) (1990). *Trends and Issues in Library and Information Science*. ERIC Report.

Dhawan, Sneha (1996). *Current Trends in Ballistic Research*. Dissertation for Master's Degree in Information Science. New Delhi: INSDOC. (unpublished).

Self Check Exercise

- 4) Differentiate between reviews, state-of-the-art reports and trend reports.

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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11.6 TECHNICAL DIGESTS

The latest scientific and technical information, marketing and commercial information is essential for the growth of any industry. The people in industry require information on new products, machinery, manufacturing processes, management techniques, etc. to keep themselves abreast of the latest development as well as to solve technical problems associated with running and management of an industrial enterprise. But, the exponential

growth and proliferation of S&T literature in a wide range of sources, makes it difficult for technical workers and executives in industry to keep track of latest developments in product designs, manufacture processes and management techniques, etc. in their area of interest. To meet their information requirement, technical digest service is provided. Technical digest, is an information service, which analyses, evaluates, consolidates and disseminates latest technical information to managerial, technical and operator level personnel in the industry.

11.6.1 Definition and Meaning

According to Webster's Dictionary a digest is defined as "to compress a piece of literature or a body of information into a short summary form, containing essential core of the matter."

A digest is a systematic condensation of a written work, often prepared by someone other than the author of the original. It is generally larger than the synopsis and sometimes with headings and subheadings to facilitate quick reference. According to Guha "digest is actually a fuller representation of a document, rewritten for a purpose or to suit the requirements of different group of people, but intended to serve as a complete substitute for the original document." Digests are generally periodical publications containing condensation of works, gathered from many sources and arranged in a systematic order.

A digest may be prepared ad hoc on request on a particular subject, or it may be issued frequently at regular intervals or in anticipation of demand.

The term 'digest' is synonymously used with compendium and/or epitome. The digest, therefore can be defined as "Body of information or written matter, involving information consolidation by condensation. It is a compendium of information gathered from various sources, systematically and methodologically arranged, classified under headings and subheadings. It is prepared either on demand or in anticipation for quick and ready reference, with subject scope spanning from literary to science and technology."

Technical digest is not so distinct from a digest, except the subject scope. Subject scope of technical digests is mainly science, technology and management aspects. According to Guha, "Technical digest is a product of condensation process. It performs an accretion function. It may be directed or oriented to various groups of user viz., managers, technicians, operators etc."

11.6.2 Need and Functions

Technical digests are useful sources of information for managerial and technical workers in the industry. Through technical digests the managers and technical workers in industries obtain information on technical know-how and other technical data helpful in their work.

Different categories of workers in industry require different types of information. Managerial personnel require product-oriented information such as technical, commercial and marketing information. An effective technical digest not only saves the time of the manager but also helps him/her in decision-making.

Technical workers/operators require information on solving technical problems, new ideas and processes, which can help them in day-to-day working. Technical digests oriented towards this group of users to meet their information requirements effectively.

Technical digests serve following functions:

- i) Keep different levels of workers in the industry abreast of latest developments in their respective fields;
- ii) Provide timely dependable information to keep them equipped with new developments taking place in their areas of specialisation;
- iii) Disseminate latest technical know-how; and
- iv) Serve as an effective channel between research and production centres.

11.6.3 Categories

Different types of digests are prepared keeping in view the following levels of workers in the industry:

- Top Management
- Middle/Supervisory Management
- Operator Level Personnel

The digest for top management should cover information on the following topics:

- Corporate Management/Planning
- Finance
- Production
- Research and Development
- Personnel
- Sales
- Public Relations
- External Regulations

Digests for middle/supervisory management should contain information, which can help them in:

- enhancing utilisation of installed capacity;
- new production processes/techniques which can result in increase in use of labour force and production facilities to maximise production; and
- problem solving and decision making.

Digests for workers/operators should contain information, which they can easily understand and put to use. Digests for workers/operators should help them in:

- solving day-to-day technical problems;
- simulating the modernisation of existing production methods and techniques;
- small improvements in manufacturing/ process techniques which lead to major saving in an industry; and
- mechanisation of existing work.

11.6.4 Planning and Preparation

Systematic planning is the foremost step in the preparation of any information service. Same holds true for the preparation of a technical digest. The planning and preparation of a technical digest involves the following steps:

- Identification of users and their information requirements;
- Sources of information and its collection;
- Information Analysis and Consolidation;
- Evaluation;
- Presentation and Layout; and
- Dissemination.

Identification of Users and their Information Requirements

Users constitute the most important element in the preparation of technical digests for an industry. For a successful technical digest service, it is therefore, essential to identify the users, their activities, functions, subject and professional knowledge. Users' requirements will depend on the nature of responsibilities entrusted to them. Different categories of users working at different levels (e.g. Managerial, Supervisory, Technician, Operator level) and in different divisions (e.g. Production, R&D, Sales and Marketing, etc.) would require different information. For instance, a person involved in production division may require information for formulating production procedures, material planning, methods of production, maintenance services, etc. Persons employed in research activity may need latest information on new products, processes, and machinery, special design considerations and emerging trends relevant to the industry. Technical digests are prepared keeping in view the specialised requirements of the users. Different types of digests are prepared tailored to the needs of different categories of users.

Sources of Information for Technical Digests and its Collection

Sources of information for technical digests are scholarly S&T journals, trade journals, manufactures' catalogues, newspapers, company reports, and companies' websites and trade portals on the Internet. The latest published sources of information on the new industrial products, processes, machinery and materials are the trade sections, news sections, and new product sections of technical and trade journals. Company's websites and trade portals on the Internet are sources of nascent information, which is not yet published.

Information Analysis and Consolidation

After collecting information from different sources mentioned above, the information is to be properly evaluated, analysed, and consolidated to compile a technical digest. Analysis and consolidation of information is to be made keeping in view the requirements of user groups at different levels i.e. managerial, supervisory, technician, or operator level.

Evaluation

Evaluation of information is essential before its dissemination to the users. The information specialist involved in the preparation of technical digests should thoroughly evaluate information to be incorporated. The information specialist should have sufficient knowledge of the subject. When in doubt, he/she should consult the manager/engineer working in the field to check the validity of information.

Presentation and Layout

Technical digests should be prepared in simple and familiar language keeping in mind the target audience. Accuracy and authenticity of technical contents,

clarity of presentation, brevity, consistency and precision are qualities of good technical digest.

The following guidelines should be kept in mind for an effective presentation:

- The writing should be easy to understand;
- Use of simple and short sentences;
- Brevity and accuracy of data and facts;
- The use of technical terms to be restricted, particularly if digests are prepared for a commoner;
- The technical terms to be preferred if digests are prepared for a specialist;
- Tables, graphs, etc. must be added wherever necessary. This will increase the value and usefulness of the digest.

The contents of technical digest must specifically include:

- How new product or process is better than the existing one?
- Whether the material used is new or it is used in a new way?
- If new material is used, then its availability for commercial use.
- The benefits of using the new technology in terms of man, material and money.
- Does the new technology involve new equipment, if so, then its availability?

The other factors to be kept in mind while preparing technical digests are:

- The digest should be designed to appeal to the initiator of action i.e. the manager;
- It must cover ideas which will initiate action;
- The digest should show how the idea presented will benefit the organisation;
- The presentation should pin-point the idea and draw manager's attention to refer to it;
- The digest should be short without compromising the essential details, as short digest is more likely to be looked up.

Apart from the contents, the layout of a technical digest is equally important. The following points should be kept in mind for the layout of the technical digest:

- It should have appropriate eye-catching heading;
- It should be short within 200-400 words and must not exceed 3 to 4 typed pages;
- The sources of information with full bibliographical details should be mentioned at the end of a digest to enable the user to refer to the original documents, if required.

Dissemination

The digest should be disseminated to the concerned user/user group at regular interval of time. There should be minimum time-lag between the collection of information, preparation of digest and dissemination to the concerned user.

11.6.5 Examples

Management Digest: Published bimonthly by SENDOC (Small Enterprises National Documentation Centre), provides digests of journal articles on human resource, employment potential, entrepreneurial skills and managerial issues.

Innovative Technology: Published bimonthly by SENDOC, provides digests of new processes and products, and new equipment using local resources aiming at cost reduction, import substitution, and export promotion.

Techman: Published bimonthly by SENDOC, provides digests of processes and products, and equipment covering wide spectrum of technologies and abstracts of technical articles.

TERI Information Digest on Energy and Environment: Published quarterly by TERI (Tata Energy Research Institute), incorporates: a) TIDE – TERI Information Digest on Energy, b) TIMES – TERI Information Monitor on Environmental Science, and c) GER- Global Environmental Review.

Self Check Exercise

- 5) Enumerate the basic steps involved in the planning and preparation of technical digests.

Note: i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

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11.7 SUMMARY

It has been observed that non-use or relatively less use of existing literature in science and technology, health, business, education and related fields is not only due to over abundance of literature and scattering of information in diverse sources, but also due to the fact that information contained in them is not being packaged in a form useful to the different groups of user. Users at different level require appropriate information, which they can easily comprehend, assimilate and make use of with certain degree of confidence and reliability within the framework of their working environment. In other words, users require consolidated information packaged in a form, which they can use immediately. In recognition of this need a number of IAC products have come out. Some of these IAC products are directed toward specialists such as scientists, engineers, Govt. officials, planners and policy makers, managers in the business and industry, etc.; while others are directed towards broader population such as farmers, workers, technicians, etc. In this Unit we have dealt with four IAC products viz. Reviews, State-of-the-Art Reports, Trend Reports and Technical Digests which are directed towards specialists. This Unit describes the need, characteristics, and functions of these products; enumerates the basic processes involved in the preparation of these products; and discusses how to evaluate and service these products effectively to the target audience.

11.8 ANSWERS TO SELF CHECK EXERCISES

- 1) Consolidated information is 'public knowledge' specially selected, analysed, evaluated and possibly restructured and repackaged for the purpose of serving some of the immediate decisions, problems and immediate needs of a defined clientele or social group, who otherwise may not be able to effectively and efficiently access and use this knowledge as available in the great amounts of documents or in its original form. The criteria for selection, evaluation, restructuring, and repackaging of this knowledge are derived from the potential clientele.

Information consolidation increases the value of information for users as follows:

It helps in decision-making and problem solving

As the amount of information presented to the decision maker is increasingly consolidated, its value increases. For instance summary has a bit more value in comparison to the original document. Merger of excerpts from a number of documents may have still more value. Evaluated information further increases the value while studies addressing the topic such as reviews, state-of-the art, market studies, statistical summaries and correlations, increase this value considerably. Highest valued of information, is that which provide alternative choices summarised from all the sources, make recommendations for decisions or for resolution of the problem.

User Benefits

- As information is increasingly expressed in everyday language and the social and cultural framework of the user, its value increases for that user.
- As the information is increasingly packaged in a way that will make its use easier, its value increases.

General benefits associated with information consolidation are as follows:

- To increase the effectiveness of information transfer;
- To encourage the intensive use of information in variety of developmental activities; and
- To increase the circle of potential users by fulfilling information requirements for evaluated and synthesised information.

- 2) Reviews perform two major functions:

- i) Historical or subject related functions; and
- ii) Contemporary or user related functions.

Historical functions relate to the development of a subject or a topic. These functions are as follows:

- Expert's evaluation of the published literature and selecting those items, which are worth saving in literature.
- Collation of information from various sources and putting them in proper perspective.
- Compaction of existing knowledge i.e. extracting new information only from various sources and leaving out other details like methodology, discussion or already known information.

- Replacement of many scattered documents with one. At times replacing the primary documents as the written record.
- Direction for further research. Reviews by critically examining the state of the art in a subject or a topic, suggest areas for further research.
- Identification of emerging discipline. Reviews by bringing together various works may identify emergence of new area.

Contemporary or user related functions of reviews, are functions which are beneficial to individual user. These functions are as follows:

- **Current Awareness Function:** Helps individuals to keep abreast of current developments in their own subject field or adjacent subject field without having to go through mass of literature published in primary sources.
- **Informed Notification Function:** In reviews most significant contributions with full bibliographical details are brought to the notice of the individuals.
- **Back up for other Literature Searching:** Reviews with extensive bibliography, serve as starting point for more current literature not yet covered in reviews.
- **Tutorial Function:** Reviews are useful to students in understanding new subjects and to specialists and researchers in continuing education and in obtaining an overview of a subject outside their field of specialisation.
- **Inspiration:** Reviews provide ideas and suggestions for further research work.
- **Feedback:** Reviews provide a measure of a researcher's own published work, as each primary document is evaluated and selected by an expert for including in the review.
- **Promote Cross Fertilisation of Ideas:** Reviews in a specialist's adjacent areas of research helps in cross fertilisation of ideas and promote research in new areas.

- 3) For evaluating reviews, beside general criteria, it is necessary to apply specific criteria because of the dual function i.e. historical and instructional function of reviews. These criteria are as follows:

Completeness: The degree to which both the subject and literature on the subject are covered.

Perspective: The degree of appropriateness in relation to both, a given subject and for a given audience.

Analysis: The Thoroughness, depth and breadth of analysis; Degree of collation of information from different sources and degree of evaluation applied to analysis.

Synthesis: The degree of compaction and relations drawn; Extent of replacement of previous information and literature on the subject; and The degree of evaluation applied in synthesis.

Value added: Identification of emerging specialties; Introduction of new hypotheses or theories; and Suggestions for future work, etc.

Utility: The degree to which a review can serve multiple functions as mentioned above.

- 4) Reviews, State-of-the-Art Reports and Trend Reports are IAC products based on the survey of primary literature published on a particular subject. All the three products report no original research. Traditional 'critical' reviews provide a narrative account of the development of a subject or a topic within a specified period of time. Such reviews have historical or bibliographical orientation. The other category

of 'critical' reviews concentrates on particular scientific or technical problem and provides its solution. Such types of reviews perform instructional role. State-of-the-Art Reports describe the current status of a subject or a topic. Their basic aim is to provide current and up-to-date status of a situation, which may be of a technology, use of a technology or impact of a technology. State-of-the-art reports are mostly prepared on technological topics and in the fields of business and commerce. Trend reports provide systematic view of recent developments and current research trends in a subject field. The basic purpose of the trend report is to briefly capture the major trends in a given area of research based on the analysis of the literature published on that subject during specified period of time, ranging from two years to five years or more. The basic differences can be enumerated as follows:

No.	Reviews	State-of-the-Art Reports	Trend Reports
1	Perform historical function	No historical function	No historical function
2	Prepared by subject expert	Prepared by information professional with subject knowledge	Prepared by information professional with subject knowledge
3	At times replaces primary documents as written record	Do not replace primary documents	Do not replace primary documents

5) The planning and preparation of a technical digest involves following steps:

- Identification of users and their information requirements;
- Sources of information and its collection;
- Information analysis and consolidation;
- Evaluation;
- Presentation and layout; and
- Dissemination.

11.9 KEYWORDS

Compendium : A short summary of the main points of a larger work.

Epitome : A condensed account of any literary work. It contains only the most important point of a book, essay, article or other literary work.

Information Consolidation Activities : The responsibilities exercised by individuals, departments, or organisations for evaluating and compressing relevant documents in order to provide definite user groups with reliable and concise new bodies of knowledge. Individuals or groups of individuals performing information consolidation activities would each constitute an Information Consolidation Unit.

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UNIT 12 INFORMATION SERVICES – PART-I

Structure

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- 12.9 Keywords
- 12.10 References and Further Reading

12.0 OBJECTIVES

After reading this Unit, you will be able to:

- learn the significance of responsive information services such as literature search, technical enquiry service, document delivery service and translation service, offered by libraries in response to user's demand;

- learn the importance of literature search in research and development activities and in business environment;
- develop the skill to retrieve relevant information from print as well as electronic resources to meet user's demand;
- explain the need and importance of document delivery service (DDS);
- identify different types of systems through which DDS can be offered;
- get acquainted with the quantum and importance of literature published in foreign (non-English) languages;
- identify organisations and translation services available to solve foreign language problems; and
- learn the impact of computer and communication technologies in delivering and improving the efficiency of these information services.

12.1 INTRODUCTION

You are familiar with the phenomena of “information explosion” which has resulted due to the tremendous increase in published literature from all over the world in a wide range of disciplines and in diverse formats. The phenomena of “information explosion” can be traced back to 60 years, to be more precise, after the Second World War, when there was sudden increase in Govt. sponsored research in the field of science and technology. The increase in R & D activities resulted in an exponential growth of published literature. The literature in S & T is doubling every 7 to 8 years since then. Taking an example of one type of publication i.e., S & T periodicals published in the world, we observe that till 1750 there were hardly 10 periodicals. Their number grew to about 1000 by middle of 19th century and to 10,000 by the end of 19th century. Presently the output of current S & T periodicals is around 80,000. In addition to this there are S&T reports, conference proceedings, patents, standards, dissertations and monographs. To cope up with this gigantic problem of information explosion, a number of information institutions, information services and products have emerged over the years and new ones are being added each year. In Block 1 and 2 of this course you have learnt about Information Institutions, Information Sources, Systems and Programmes. In Block 3 you will learn about Information Products and Services. Unit nos. 10 and 11 of this Block deal with Information Products and Unit nos. 12 and 13 cover various types of Information Services. Information Services can be broadly grouped into two categories:

- i) Active or Anticipatory Information Services; and
- ii) Passive or Responsive Information Services.

Anticipatory information services are offered in anticipation of the demands from the users while passive or responsive services are provided in response to a request from the users. Both types of services promote the use of library material, connect the users with library documents and meet the information requirements of the users. The depth and range of these services vary with the type of library and the kind of user a library or information centre is set up to serve. In this Unit you will learn about responsive information services like Literature Search and Compilation of Bibliography, Technical Enquiry Service, Document Delivery Service and Translation Service. In addition you will learn about Internet services.

12.2 LITERATURE SEARCHES AND BIBLIOGRAPHY

12.2.1 Literature Search: Definition

According to the Online Dictionary of Library and Information Science “Literature Search is an exhaustive search for published information conducted systematically using all bibliographic finding tools, aimed at locating as much material on the topic as possible, an important initial step in any research project.”

Literature Search can be equated with Long Range Reference Service, which is generally provided to a specialist who is seeking information for research work or to solve a particular problem. This type of service is more common in a special library. The request may come from a professor, a business executive, a professional or a research scientist. In this type of service, information is searched in several sources like books, periodicals (primary as well as secondary periodicals), non-book material, etc. Sometimes to provide this service informal sources are also consulted. To provide this service a wide range of sources are consulted, the time taken is much longer than the Short Range Reference Service or Ready Reference Service. Usually Ready Reference Service is concerned with providing answers to fact finding questions such as what, where, who, when, and how types. What is the population of Ethiopia? Where are the Alps Mountains located? Who discovered Penicillin? When will the next solar eclipse occur? How many bones are there in a human being? Where can I find a biography of Nobel Laureate Sir C.V.Raman? The requested information is located in standard reference books like dictionaries, encyclopaedias, yearbooks, almanacs, biographical sources, etc. Time required to answer these queries is very short ranging from a few minutes to half an hour. Ninety percent of these queries are simple to handle. Only 5 to 10 per cent of the queries may take hours of research to find the answer. In “Literature Search”, on the other hand, the search has to be more exhaustive, both in depth and range. More than one source has to be consulted to carry out adequately the search. Besides bibliographies, other secondary sources like indexing and abstracting periodicals, reviewing periodicals are consulted to find the information.

12.2.2. Literature Search: Need

Literature Search plays an important role in research activities. Any research worker while initiating any new research project or at the time of writing his/her research results, needs to know in detail what has already been reported by other workers in his/her area of research. This requires exhaustive search of previously published literature and compilation of a bibliography. Literature searches are also carried out to solve any research problem to find out how others have handled the same problem. The literature search thus:

- helps in study and research;
- avoids duplication of research efforts;
- helps in solving research problems; and
- helps in identifying potential areas of research.

12.2.3 Compilation of Bibliography

Literature search and compilation of subject bibliography is one of the important services of libraries. Bibliographies are compiled on request. Sometimes these bibliographies are compiled on a regular basis in anticipation of a user's needs. At times bibliographies

are compiled on special occasions such as during seminars and workshops to provide participants with the latest literature on the subject. University and special libraries offer this service more frequently than the public libraries. For compiling a bibliography it is very important to know the basic steps involved in its preparation. In this Unit, you will learn how to carry out literature searches (manual as well using computers) and compile subject bibliographies.

12.3 SEARCH TECHNIQUE

12.3.1 Manual

In a manual search and compilation of a subject bibliography the basic steps can be summarised as follows:

- 1) Understanding the subject
- 2) Decision on the scope, coverage and period
- 3) Formulation of search strategy
- 4) Scanning

Searching of Tertiary, Secondary and Primary Sources

- 5) Entry making
- 6) Arrangement
- 7) Indexing

Step 1: Understanding the Subject

In this step you should gather the knowledge on the subject. You should know the exact topic to be covered and related areas to be included. For this subject dictionaries and subject encyclopaedias are helpful. Here personal interaction with the user is very important, as it helps to know his/her exact subject requirements.

Step 2: Decision on the Scope, Coverage and Period

The next step is to decide on the scope, coverage and period of the bibliography.

Scope: The bibliography to be Comprehensive or Selective.

Coverage: The types of documents to be covered (e.g. Periodical articles, Conference papers, Dissertations, Research reports, Monographs, etc.).

Period: The bibliography to be Current or Retrospective.

For making the above decisions, it is very important to have personal interaction with the user. Personal interaction with the user is known as 'Reference Interview'. This will help to know:

- The query thoroughly.
- The purpose for which information is required.
- Background of the user.
- Scope, coverage and period of the documents to be included.
- What sources user has already consulted?
- The time frame within which information is required.

Step 3: Formulation of Search Strategy

In this step you formulate a systematic plan for conducting a search. First you formulate a clear and concise topic statement. The next step is to identify the main concepts in the topic. Lists of authorised subject headings and descriptors in the appropriate indexing system can be consulted to find preferred terms to represent the main concepts. Then most appropriate finding tools for searching are identified. Normally one has to start from tertiary sources to identify secondary and primary sources for searching. First and foremost is to check whether any bibliography exists already on this topic. If there is one already compiled/published, it will save time of searching the previous years literature. There are four such sources for locating already compiled subject bibliographies:

- 1) *Besterman T. Physical Sciences Bibliography of Bibliographies, Totowa, N.J., Rowman and Little field, 1971, 2 Vol. (A reprint of Besterman's bibliography of bibliographies (4th ed. 1965-66 4v. and index).*
- 2) *Bibliographic Index: A Cumulative Bibliography of Bibliographies. N.Y. H.W.Wilson Company, 1937 to date.*
- 3) *Walford's Guide to Reference Material. 8th ed. London: Library Association. 3 Vol.*
Vol.1: Science and Technology (Ed. By Mulley M., Schlicke, 1999).
Vol. 2: Social and Historical Sciences, Philosophy and Religion (Ed. By Day A and Welsh M, 2000).
Vol. 3: Generalia, Language and Literature (Ed. By Chalcraft A, Prytherch R and Willis S, 1998).
- 4) *Sheehy, Eugene P. Guide to Reference Books. 10th ed. Chicago: American Library Association, 1986.*

Besterman's Bibliography of Bibliographies is helpful for searching retrospective bibliographies, while other sources helps you to find more current bibliographies. In the next step you should look for a review article on the topic. A good review prepared by an expert contains a fairly comprehensive list of important references. This list can serve as a starting point for the bibliography. In case, the review article is recent and bibliography appended is exhaustive, only updating of the aforesaid bibliography is required. This not only saves time but also reduces labour and cost. The next step is to select appropriate indexing and abstracting periodicals to carry out actual searching. The following two sources are helpful in identifying A/I periodicals on the subject.

- 1) *Ulrich's Periodical Directory. 42nd ed., New Province, N. J. etc., R R Bowker. 2004 . in 5 Vols. Published annually since 1932 . Ulrich's on Disc (Window-based CD-ROM Version since 1986, updated quarterly), Web version (<http://www.ulrichsweb.com>) updated weekly.*
- 2) *Abstracting and Indexing Directory. Detroit(Michigan), Gale Research Corp., 1982. 3 Vol.*

Step 4: Scanning

In this step actual searching is carried out. A/I periodicals are scanned to retrieve relevant items for bibliography and finally primary sources are consulted to find more current information.

Since the coverage of conference papers, research reports, theses, patents and standards is not very comprehensive by most of the international A/I services, it is advisable to

consult specific sources exercising bibliographical control of the above mentioned literature. Following Publications should be consulted to cover these items:

Conference Papers: *Index to Scientific and Technical Proceedings. Philadelphia, Institute for Scientific Information, 1978-. (Monthly)*: This publication indexes published conference proceedings at individual paper level with permutterm index of keywords from titles of papers, author/editor index and an index of author's corporate affiliation.

Conference Papers Index. Louisville, K.Y., Data Courier, 1978- (Monthly) with cumulated annual index available separately. Monthly issues of this publication have programmes of scientific and technological conferences grouped by subject. Information includes full title of the meeting, inclusive dates, location, names of sponsoring organisations, ordering information for publications and a list of papers presented.

Research Reports: *National Technical Information Service (NTIS), US Department of Commerce, 1964*. NTIS is the federal government's central resource for government funded scientific, technical, engineering and business related research reports by or for the U.S. government it also covers report literature from other international sources. Approx. 2.5 million products are available in a variety of formats including online, electronic, multimedia, CD-ROM, paper, and microfiche.

Theses: *Dissertation Abstracts International. Ann Arbor, Mich., University Microfilms, 1861-*: Dissertation Abstracts International is guide to doctoral dissertations and master's theses in every academic discipline (approx. 3000 subject areas). Covers more than 90% of doctoral dissertations accepted each year in North America. Since 1980 the coverage was expanded to include European institutions. Over 200 other institutions are covered. Its online product is Dissertation Abstract Online (<http://www.lib.umi.com/dissertation>). Produced by ProQuest Information Learning, the database contains about 1.6 million records and is updated monthly.

The information about doctoral theses awarded by Indian universities is disseminated by Association of Indian Universities through the column "Thesis of the Month" in its newsletter "University News". University News is published weekly.

Patents: EPIDOS-INPADOC databases are the largest patents databases in the world covering bibliography of all the patents applied and granted in 65 countries and international patenting organisations, consisting of over 33 million references. Almost 3 million references are added every year.

Indian patents filed and granted are published in Gazette of India, Part III; Section II. This is a weekly publication. NISCAIR (Formerly INSDOC) has brought out Indian patents on CD-ROM (INPAT) covering Indian patents granted and published since 1975 to 2002. INPAT database has over 52,600 records.

Standards: Standard bodies all over the world formulate standards and bring out periodical publications in the form of catalogues, handbooks, etc. They may be consulted for tracing standards on the subject. Bureau of Indian Standards (BIS), brings out BIS Catalogue annually. BIS standards can be searched online using BIS e-Catalogue (<http://www.bis.org.in>). Similarly standards of International Organisation for Standardisation (ISO) can be searched using ISO Catalogue 2004, or ISO CataloguePlus on CD-ROM, or its online catalogue (<http://www.iso.org>).

Citation Indexes: Sometimes, some articles, which cannot be retrieved through conventional A/I services can be retrieved through citation indexes. The three citation indexes which are covering world literature of different disciplines are Science Citation

Index, Social Science Citation Index, and Humanities Citation Index. Here searching should be done by author's old but outstanding paper. Citations received by this paper over the years will produce a good bibliography.

Step 5: Entry Making

In this step entry is prepared for each item that is identified as relevant. The entry should contain all bibliographical details of the document in a standard pattern. For this following International or National standards may be followed:

IS: 2381:1978: Bibliographical References Essential and supplementary items.

ISO: 690:1975: Documentation–Bibliographical References-Essential and supplementary elements.

Each entry should be recorded on 5X3" cards, so that the entries can be arranged in a systematic order.

Step 6: Arrangement

The entries should be arranged in some convenient order i.e., alphabetical, chronological or systematic order. If number of entries in a bibliography is small, the entries may be arranged alphabetically author wise or chronologically by year of publication of the document. But if the number of entries is large, it is better to arrange them in a classified order or under broad subject headings in alphabetical or systematic order.

Step 7: Indexing

In this step various indexes (title index, author index, subject index) are prepared to satisfy various approaches of the user. For a small bibliography, there is no need to provide an index. But for a large bibliography author, subject and title indexes may be prepared as per the need.

12.3.2 Computer-based

Advent of computers and communication technologies and their applications in bibliographical organisation of published literature have opened up new vistas for searching and retrieving information at an amazingly great speed and with much more efficiency.

Nowadays all major primary, secondary and tertiary publications are available in machine readable form. Most of the National and International A/I periodicals are available in four different versions as follows:

- i) CD-ROM Disc Version;
- ii) Remote Access Online Version through vendors (e.g. DIALOG, SDC, etc.);
- iii) Remote Access Web Version; and
- iv) Print Version.

While print version of these periodicals can be searched manually through various printed indexes provided by the publication, the other three versions offer searching on computer. In this section you will learn about computerised searching and various techniques of online searching.

Development of Computer-based Searching

Development of computer based searching can be traced back to mid 1960s when indexing and abstracting services first used computers to print their paper products. They created magnetic tapes that were interpreted by computers and printed their products. These magnetic tapes could be read by computers for other purposes also.

Companies and Govt. agencies developed computer software that could manipulate information on these tapes in new ways. This software allowed searching the tape for indexed term or group of terms on the computer and retrieving articles bearing these terms. In the beginning, Computers required much time in processing of these requests and work was done on delayed basis called "Batch Processing". A request was submitted to the computer centre on one day and the results were available on the next day. If there were any typographical or logical errors in the request, the same had to be corrected and request resubmitted for processing the next day, which delayed the results for another day.

During late 1960s and mid 1970s, computer power, speed and memory increased, as did the ability to communicate with other remote computers over the existing telephone lines. Thus, online searching became feasible. Online searching is the process of interrogating a computer system to resolve particular request for information. The search process is interactive and user can modify the search until desired results are obtained. The number of computerised files called, databases for online searching also grew. The first major online dial-up service was MEDLINE, the online version of MEDLARS (Medical Literature Analysis and Retrieval System), which was followed by other commercial online services from DIALOG (Lockheed) and ORBIT (SDC) (Walker & James 1993). Since then many organisations have started offering online and database search services. By 1975 there were 300 public access databases from a range of different vendors. Database industry has been growing since then. From 1975 to 2004, the number of databases grew from 301 to more than 18,000 and number of records grew from 52 million to over 12 billion. The New 2004 edition of Gale Directory of Databases lists more than 18,000 online databases. The directory comprises two volumes Vol. I: Online Databases and Vol. II: CD-ROM, Diskette, Magnetic tape, Handheld and Batch Access Database Products.

Initially a majority of online databases provided bibliographical references as output of search session(s) and were called bibliographical or reference databases. More recently increasing number of databases are becoming available that retrieve actual information rather than bibliographical references. These databases are either Full -Text, where the complete text of the documents including graphics and pictures are available or Numeric where machine-readable numeric data is available. With the development optical disc systems, CD-ROM (Compact Disc Read Only Memory) systems proliferated. Each CD-ROM disc stores approximately 650 million bytes of information. Optical imaging systems, because of relatively inexpensive equipment and the speed of processing, offered libraries and database producers to store large quantities of data on durable CDs in all formats (text, numbers, images, or combination of all these in digital form). Information sources available on CD-ROM range from common reference sources like dictionaries, encyclopaedias, etc. to subject specific bibliographic, full text and multimedia databases. Over 10,000 information sources are available on CD-ROM. With the advent of Internet and World Wide Web, online searches can be conducted on information sources that are distributed all over the world. To search these information sources one can straight go to the web page where information is located, provided one knows the URL (Uniform Resource Locator) of the web page.

Rowley (1999) has identified three generations of online searching to which fourth one was added later by Chowdhury and Chowdhury (2001). These four generations are:

- 1) The first generation up to 1981, was characterised by dumb terminals, slow transmission speed, and mostly bibliographic databases.
- 2) The second generation, which continued through 1980s was characterised by PCs and workstations, medium transmission speeds, bibliographic and full-text databases and interfaces directed to end-users.

- 3) Third generation, which started at the beginning of 1990s, has been characterised by multimedia PCs, higher transmission speeds, bibliographic as well as full-text databases, and improved user interfaces, with help and tutorial facilities.
- 4) Fourth generation, which started at the beginning of 1990s, with web access to online search services. User can go directly to the web address of an online services provider to log on to the service and retrieve the required information. Web based online search services such as Dialog web, Ovid online, OCLC first Search, etc., provide fast and easy access to online databases with a number of search and retrieval facilities.

Earlier online searches were very expensive and one had to take help of intermediary to conduct an effective and efficient online search. Over the years online searching became less expensive and with improved user interface and step-by-step instructions provided by the online service provider enabled the end users to conduct the searches themselves without the help of intermediary. Major advantage of online searching is its speed and currency of data. Another additional advantage is that its each search session is costed and while you are online you know how much you have to pay. However, every time you conduct an online search, you have to pay. The charges include i) vendor system usage charges, ii) telecommunication charges, iii) database access charges, iv) citations royalty charges offline/online, v) vendor's shipping or minimum printing charges and vi) vendor subscription charges. Charges for the first three items are on hourly basis, for the fourth one per citation basis, for fifth one per transaction basis and last one on yearly basis. This is not the case with CD-ROM databases. Once the CD-ROM product is purchased one can search it unlimited number of times without paying any additional charges. Most of the CD-Rom provides search software to user with much of the power of multiple indexes and Boolean logic available in commercial online search environment, without the time and cost pressures. In end-user searching, users are able to explore the database, see the search results, and print out citations during the search.

Advantages of Computer-based Searching

1) Improved Searching Capability

In a printed reference source, searching is limited to the indexes (author, subject, keywords, etc.) provided by the publication. Cumulated indexes as well as the indexes in each current issues of the publication have to be searched and entry number of each relevant item is to be noted down. Then volumes as well as issues of the publication carrying those entry numbers are physically located and each entry number is searched for noting down bibliographical details of the items found relevant to the search. The process is really laborious and time consuming. When the same publication (reference source) is converted into electronic form, it is fundamentally altered by the expanded capabilities and speed of the computer. Sitting at the computer terminal one can search cumulated database of the same source and retrieve hundreds and thousands of records in one go. For instance LISA (Library and Information Science Abstracts), an international abstracting periodical is published fortnightly in print form. While its electronic version, comprising all LISA records from 1969 onwards is available for online searching on the web as well as on commercial online service provider such as DIALOG. In addition, one can view the search results, modify the search, select the relevant items and get the list printed. The power of computer to scan, list, and record information is growing day by day. Search options provided by electronic databases are also far more than that of their print counterparts. Some of the search options provided by electronic databases are as follows:

- a) Keyword and Phrase Search
- b) Boolean Search
- c) Truncation
- d) Proximity Search
- e) Limiting Search
- f) Range Search

Keyword and Phrase Search: A search can be conducted by entering single search term or phrase comprising more than one term.

Boolean Search: This search enables search terms according to Boolean logic. Three types of Boolean searches are possible: AND search, OR search and NOT search. The AND search allows user to combine two or more search terms using AND operator. The search will retrieve all those items that contain all the constituent terms. The OR search allows user to combine two or more search terms such that the system retrieve all those items that contain either one or all the constituent terms. NOT search allows the user to specify those terms that they do not want to occur in retrieved records.

Truncation: Truncation is a facility that enables search to be conducted for all different forms of a word having same root. Various systems allow searching terms with right, left and centre truncation.

Proximity Search: This search facility allows the user to specify i) whether two search terms should occur adjacent to each other ii) or one or more words occur between the search terms iii) or the search terms should occur in the paragraph irrespective of intervening words.

Field Specific Search: A search can be conducted on all the fields of a database or it may be restricted one or more chosen fields to produce more specific results.

Limiting Search: This facility allows the search to be limited by specific criteria such as language, year of publication, type of information source, etc.

Range Search: This facility allows selecting records within certain data range. Range searches are useful with numeric information. Range searches can be limited by publication year.

2) **Displaying The Index:** In electronic databases there is a facility to display range of terms in context. Here a primary index, called the inverted index or inverted file is built on an alphabetical basis, in which each retrievable word in the database is listed in a single sequence. This facility allows one to see a term, in context with terms immediately preceding or succeeding it alphabetically. In addition to this, this index also shows number of records in the database that contain that term. This feature allows one to identify most productive terms to retrieve a particular concept and also the terms that are in close proximity, which the searcher had not earlier anticipated. It also allows one to preview the effect of truncation.

3) **Improved Speed:** Searching electronic databases is much faster than printed sources. Searching electronic databases allows the searcher to be in command of his/her own searches, relieves him/her the burden of writing down the citations and provides him/her with more citations in less time than a manual search. These citations can be printed on paper or downloaded to the searcher's diskette for later handling and printing.

Self Check Exercise

- 1) What do you understand by different generations of online searching? Discuss briefly.

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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Basic Steps for Computer-based Searching

As discussed earlier electronic databases are available in three different formats for online searching viz., on CD-ROM, through commercial online search service provider (such as DIALOG etc.) and on the Web. The electronic databases in all the three formats offer more search options, can be searched speedily, and are updated more frequently than their print counterparts. The difference between Online, Web and CD-ROM versions is their update frequency. Online and Web versions are updated more frequently than their CD-ROM version. For example print product of Ulrich's Periodical Directory is updated and issued once a year, CD-ROM version (Ulrich's On Disc) is updated and issued quarterly and its Web version (ulrichsweb.com) is updated weekly. More over, web version of electronic databases provides some additional search facilities as well as link facilities. For instance, web version of Ulrich's Periodical Directory contains search and browse indexes (such as language and frequency) not found on the CD-ROM or in the print version. In addition, the web version links the users to related serials for alternate titles and alternate media formats; contains URLs and e-mail addresses for link journals and publishers; gives users access to serials information such as tables of contents, article abstracts, full-text journals and document delivery. It also provides usage statistics.

The steps involved in searching electronic databases vary from system to system because each system has its own custom-built interface that allows specific type of search and specific operators and specific search command. Nevertheless, with the introduction of web-based graphical user interfaces the task of online searching has become quite easy. Most of the online service providers and CD-ROM producers offer free training modules, where a novice user can search the database step-by-step and retrieve the required information. Some CD-ROM products from one company can be searched using a common interface designed for all the product of the company. For instance, WINSPIRS is the search interface for all the Silver Platter products on CD-ROM. The search fields, search syntax, operators, etc. vary from one CD-ROM to another. The same is the case with online databases. In addition, online search services have various other components such as database producers, who provide the resources to be accessed online, search service provider or vendors, which provide access to the databases and software for conducting search, the telecommunication link such as Internet, which connect the searcher with the search service provider and the databases, and a local workstation through which the user is linked to the service. Where as CD-ROM systems are distributed to the users and mounted on CD-ROM workstations. The basic components of CD-ROM station include a drive to read the

CD-ROM, a personal computer or workstation to run the drive, a search software to manipulate the data on the CD-ROM. CD-ROM systems are frequently linked together in a LAN (Local Area Network) that combines a powerful computer as a central processor for a centrally located set of CD-ROM drives with multiple workstations at various locations for users. When libraries use LANs, multiple users get the advantage of a fast computer at a much lower cost to the library. A printer is often associated with a CD-ROM station. Sometimes all the associated equipment is leased from the database producer as part of subscription package to the CD-ROM product. In some cases, the library owns the equipment, and only discs are acquired on subscription basis.

To conduct effective and efficient searches one has to familiarise oneself with various search and retrieval options available with the specific electronic database in question. But, there are some basic steps you must know for conducting CD-ROM or Online searching for general searches as well as for compiling a bibliography on a specific topic. These steps are as follows:

- 1) Understanding the subject;
- 2) Decision on scope, coverage and period;
- 3) Internet access to online search service arranged;
- 4) Log on to the online search service provider;
- 5) Select the appropriate database;
- 6) Formulate the search expression;
- 7) Select appropriate format to display the retrieved records;
- 8) Reformulate the query, if necessary; and
- 9) Select the mode of delivery.

First two steps (**Step 1** and **2**) are same as in manual search. Step 3 and 4 are not required while searching CD-ROM databases.

Step 3: To Arrange Access to Online Search Service

This involves registration with Internet service providers like BSNL, MTNL, Satyam, VSNL, etc. The connection may be Dial-up connection, ISDN connection or through leased lines. Next is to register with online search service provider, which may be a vendor like DIALOG, SDC (Providing access to a number of databases from different publishers) or a publisher providing web access to its own databases (e.g. H. W. Wilson). This can be done through subscription or licensing agreement. On registration you will get user ID and password. The access rights have to be obtained before the search begins.

Step 4. Log on to the Online Search Service Provider

This is usually done through the web interfaces of the online search service providers. At this stage you need to know the relevant web address (e.g. for DIALOG it is <http://www.dialog.web.com>), user ID and password. Many online search service providers offer online registration as well.

Step 5: Select the Appropriate Database

Next step is to select appropriate database to search. Most search services allow users to browse through database categories to select the appropriate database(s). DIALOG has DAILINDEX, a facility which allows users to see how many times a

given search term occurs in a set of chosen databases. This information helps user to select appropriate database to conduct actual search.

Step 6: Formulate the Search Expression

This involves selection of appropriate terms or phrases for searching the database. This is normally done before one begins the search. First pre search interview is carried out with the user. Here the user is asked to fill a form in which search question is stated. User is asked to write a paragraph on the search topic, give title and purpose of search, list one or two important references, write names of important people in the field, and a note indicating maximum cost. The use of this form saves valuable time. The filling up of the form forces user to consider the question and be precise in its formulation. Then make a list of keywords and synonyms before the search begins. Here one must understand the difference between a controlled vocabulary search and a free text search. A controlled vocabulary exists when subject headings or descriptors are assigned. In a manual search, if one wants to know what subjects have been used, a list of subject headings, such as Library of Congress or Sears List, is consulted while in online search thesaurus is consulted. Many bibliographic databases have their own specialised thesaurus. Several vendors have loaded the thesauri online. Searchers have the option of requesting a list of alphabetically related terms to select appropriate terms or phrases for conducting search. At the same time you should have the knowledge of nature, content and structure of the database, fields that are searchable, what search facilities are available (such as word or phrase search, etc.), and what appropriate operators are. The search operators and syntax for formulating search expression vary from one search service to the other. Most of the online search service providers offer two types of searches, one for a novice searcher and other for expert searchers. For novice searchers there is a graphic user interface and for expert searchers the interface is command driven. Users wishing to use expert search interface must have knowledge of the various search commands and their order of execution. Once search expression is formulated, then actual online searches are conducted.

Step 7: Select the Appropriate Format

When the proper command is entered, the online system gives the searcher an alphabetical display of retrieved records. To see the records, you have to specify appropriate format, that is, brief display format or display of full record. In the case of CD-ROM searching display of full record may not incur extra cost, but in case of online searching, charges are time related and if the option to display full record is chosen the process may be time consuming depending on the network traffic. Hence, it is more efficient to choose brief display option for scanning and selection of the retrieved records from the list and going in for full display format for selected records. The ability of online system to display sample citations is one of the prime advantages of online search. It allows immediate modification of the search.

Step 8: Reformulate Search Expression, if Necessary

In case search results are not satisfactory, you can reformulate your search statement. Online searching is usually a repetitive process, that is, user conducts several searches, compares the results and modifies search statements or conducts a new search in order to get better results. For instance, if no citations for the subject are found or if number of citations are too limited, you can broaden the search by using "OR", i.e. by adding related yet relevant terms. When search turns up too many citations, then other parameters can be introduced to limit the response. The number of citations can be restricted to certain year of publication or languages. Employing the Boolean "AND" causes the search to be more specific. Truncation permits searching of word stem. It is used for a variety of purposes, including the elimination of need to think all possible

variations of a single term. A word stem may be specified and computer will retrieve any term beginning with that stem. For example “waste\$” on the keyboard will result in retrieving “waste”, “wastes”, “wasted” or the multi-term “waste-material”, “waste-management”, etc. Depending on the system, it may be possible to retrieve terms for middle of descriptor.

Step 9: Select the Mode of Delivery

You may download all the selected records online on to your local computer or select an offline printout by mail.

Search Failures: The search failures or poor results are mainly due to the searcher’s lack of familiarity with the indexing vocabularies. Each database has its own vocabulary; the searcher’s grasp must be broad. In the case of science and technology, new terms are introduced very frequently and searcher’s lack of knowledge of new terms leads to search failures. In computer produced indexes, synonymous terms are not covered adequately, which gives poor results. Here, thesaurus can help, if updated regularly.

When to conduct Manual or Online Search:

Manual search is a better method when

- only one or two citations are required or
- search is to be conducted on a broad subject area or
- an overview of a topic is required or
- search is to be conducted on a single index.

Whereas, online search is a preferable method when

- there is an exhaustive search on a topic pertaining to last many years or
- search is to be conducted on more than one databases or
- while searching a complicated and highly specific topic.

Lastly, one must take into account the benefit of online searching i.e., the speed, depth of indexing, ability to coordinate terms, free text searching, etc. while making a decision on manual or online search.

In brief, in this section, we have discussed the need and importance of literature search in R&D related activities. Explained how literature search and compilation of a comprehensive bibliography differs from searching the literature to find answers to fact-finding questions. Described basic steps for conducting manual as well as computer-based search for compilation of comprehensive subject bibliography. Described briefly the development of computer based online searching during the past four decades. Pointed out the advantages of computer-based search over manual search. Listed the information sources to be consulted for compiling a subject bibliography, starting from tertiary to secondary and primary sources of information. Importance of citation indexes, conference papers, research reports, theses, patents and standards for making bibliography comprehensive, has been pointed out and sources exercising bibliographical control over these publications have been listed.

12.4 TECHNICAL ENQUIRY SERVICE

12.4.1 Definition, Purpose and Scope

The special library generally provides technical enquiry service to people in business and industry. The definition of the term “Technical” as given in the World Book Dictionary states:

- i) Of having something to do with special facts of science or art: ‘Electrolysis’, ‘Protein’ are technical words.
- ii) Or having something to do with mechanical or industrial arts or applied sciences.

In the present context we may define a technical query as a query, which is related to mechanical/industrial arts and applied sciences and emanates from the specialists working in business and industrial sector. Information requirements of people in business and industry vary widely. It may be as simple as requiring the name and address of a particular industry or firm to the complex ones like marketing strategy, financial performance, product development strategy, marketing share, credit rating, etc. of rival companies or techno-economic feasibility of setting up of an enterprise. In general, information requirements of people in industry can be broadly grouped into following three categories: i) Technical and technological information, ii) Developmental information including marketing and iii) Regulatory information. Technical and technological information cover information about new products, process of manufacture, raw materials and machinery, testing facilities, techno-economic feasibility and managerial aspects of running an enterprise. Developmental information covers data on existing capacity, production, import/export, and investment, marketing trends, future demands and distribution channels. Whereas regulatory information covers policies and programmes of the government, getting licenses, import regulation relating to a product or machinery, sources for raising funds, registration with and clearance from health authorities, drug controller, etc. To meet these information needs various information sources, documentary sources as well as non-documentary sources such as experts are required to be tapped. The technical query may pertain to any of the above-mentioned areas. While many of these queries may be easily handled by an experienced reference librarian, but for some the help of an expert is required. In this Unit you will study about various documentary as well non-documentary sources that are required to provide technical-enquiry service in a library.

Purpose and Scope

Purpose of the query may be for solving a technical problem, repairing or setting up machinery, or for planning, decision making, implementing a decision, etc.

The scope of the query varies with the type of query. For example, for technology development, the query may relate to comprehensive search of literature. On the other hand if the query is for simple fact or data finding information such as chemical formula of a chemical compound or functioning, repairing and maintenance of industrial machinery, searching in the relevant handbook or a manual will suffice.

Self Check Exercise

- 2) What do you understand by a technical enquiry? How it differs from general inquiry?

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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12.4.2 Search Technique

Depending on the query, the search may be manual or computer-based. For simple facts and data finding questions, where the answer is readily available in reference sources like directories, handbooks and manuals, a manual search is preferable. But if the query is a complex one, requiring search in various information sources, then computerised search is a better method. Even for finding latest information on various acts passed by the government, government policies relating to an industry, export and import data of certain products, loan facilities provided by the banks, etc. computerised search on the Internet is better, because this information is available on the relevant websites, you have to know the URL (Uniform Resource Locator), i.e. the web address of the site. For instance, Department of Industrial Policy and Promotion under the Ministry of Commerce and Industry, India has a website (<http://www.dipp.nic.in>) which provides latest information on government incentives, licensing policy and procedures, industrial policy, Direct Foreign Investment (FDI) policy, foreign collaboration and import of foreign goods, Intellectual Property Rights relating to Patents, Designs, Trade Marks, and Geographical Indications of goods. The profiles of industries under the jurisdiction of the Department are also available. This site provides links to related Indian as well as foreign websites. The site also provides Bulletin Board Service, through which any user can send a question electronically and get back the reply electronically. Bulletin Board has list of previous questions and answers also on the board. There is chat facility provided by the site everyday between 11 to 12 A.M. and 4 to 5 P.M. Similarly, India Web Directory (<http://www.indiacatalog.com>) provides comprehensive listing of Indian industrial and business enterprises covering popular industries, banks and financial institutions, financial consultants, investment banks, chambers of commerce, stock exchanges, legal services/law firms, venture capital firms and so on. A brief write up and web address of each firm are provided. For detailed information one can go to the relevant website.

12.4.3 Information Sources

Information sources that are required to be searched or consulted to provide Technical Enquiry Service can be broadly grouped into two categories: i) Documentary Sources; and ii) Non-Documentary Sources.

I) Documentary Sources

- a) S & T Research Periodicals
- b) Trade and Business Periodicals
- c) Trade and Business Catalogues, Directories, Companies' Websites
- d) Handbooks and Manuals
- e) Advertisements
- f) Patents
- g) Standards
- h) Statistical Sources

II) Non-Documentary Sources

- a) Consultants and Consultancy Organisations
- b) Information Analysis Centres
- c) Patents Attorneys
- d) Trade Representatives

I) Documentary Sources

a) S&T Research Periodicals

For example if there is a request for latest research information on a particular chemical process from an engineering firm, to find the requisite information, the search has to be carried out for relevant articles in S&T periodicals. For this purpose, the search technique will be same as mentioned in section 12.3 of this Unit, that is, identify the relevant bibliographic database(s) for purposes of search and retrieve citations of relevant journal articles.

b) Trade and Business Periodicals

For answering queries related to latest information on trade and business, the relevant articles in trade and business periodicals are required to be searched. For this purpose secondary and tertiary sources are consulted to find the primary source where actual information resides. There are a number of full-text as well as secondary information sources which provide access to trade and business related information. Two such sources are as follows:

ABI/INFORM Global: ABI/INFORM is one of the most popular business information databases. It is available in different formats and from different vendors, such as UMI, Silver Platter and Dialog. ABI/INFORM global database from UMI (available on the web at (<http://www.bellhowell.infolearning.com/proquest>), provides citations and abstracts for articles from over 1000 worldwide business periodicals for information on advertising, marketing, economics, human resources, finance, taxation, computers and more. The database contains full-text for over 500 periodicals. The database also contains information on 60,000 companies.

LEXIS-NEXIS: NEXIS is one of the world's largest news and business online information service. It has a collection of full-text databases offering a comprehensive source of electronic information for business, financial news, market information research. At present there are more than 170 libraries with more than 5600 databases available. LEXIS online is a legal research service. It provides access to comprehensive collection of full-text primary legal sources such as law reports, unreported cases and statutory texts. LEXIS-NEXIS service is available via web, dial-up online, CD-ROM and in print (<http://www.lexis-nexis.com/lnc>).

c) Trade Catalogues, Directories and Websites

Engineers and technical personnel working in an industry often require information on the availability of a machinery, components of a machinery, tools, material, etc. for designing and bringing out new products or for solving their day to day problems. These persons often require names and addresses of the company and their agents/dealers. Queries related to this type of information can be easily met by trade literature and catalogues, company's website and trade and business directories. Some representative examples are listed below:

Kothari's Industrial Directory of India. Madras: Kothari Enterprises. 1996/1997: The directory is divided in two parts, first part gives general information on Indian economy including information on recognised Indian stock exchanges, chambers of commerce, and key statistics of the Indian economy. The second part provides profiles of major industries, arranged by broad subjects (e.g. Cement, Chemical, Electronics, etc.). Each section begins with an industry profile, followed by information on companies within that industry. Company information includes date of incorporation, address, directors, statement of objectives, activities and a financial summary.

Thaper's Indian Industrial Directory. Calcutta: Indian Industrial Directory. 1994/95. 2 Vol.

Volume 1: Arranged by industry and lists Indian corporations and contact information.

Volume 2: Includes the names and addresses of companies belonging to sixteen Indian Export Promotion Councils.

A-Z of Business Information Sources. Kingston-Upon-Thames, Croner. Updated quarterly, comprises alphabetical lists of subjects showing the relevant sources, and lists directories, periodicals, statistics, market reports and institutional sources such as trade associations. Its loose-leaf format is updated quarterly. Croner publishes a regular directory of web addresses as *Business information bulletin: A-Z of useful Internet sites*. This comes as part of subscription to the A-Z of business information sources.

Kelly's Business Directory, East Grinstead, Reed, annual : The directory first published in 1877, provides following information for 105,000 companies: address, telephone number and a phrase indicating the nature of business. Print version of the directory has three sections that are cross-referenced to provide quick and accurate search. Its CD-ROM version is known as Kelly's Industrial Directory CD. The CD is based on hard copy version but contains 55,000 more companies than the print version and is updated half yearly. The directory forms the online version of Kompass, which is accessible via DIALOG and Reedbase Kompass Online.

Kompass, East Grinstead, Reed, annual : Over 900,000 companies from all over Europe are covered in the entire series of Kompass published by Reed Information Services (<http://www.reedinfo.co.uk>). The four volume Kompass UK provides corporate profiles of 46,000 companies and 41,000 products and service classifications: company information, products and services, financial data, parents and subsidiaries, and industrial trade names. Online access to Kompass is through DIALOG and Reedbase Kompass Online. Its CD-ROM version is Kompass Plus. It can be purchased in separate volumes or as a complete set.

Kompass International Register Editions: Formatted in the same way as U.K. Register, these are available for 70 countries. Information is collected privately by each local Kompass franchise.

Selected Internet Resources for Indian Companies Information

Federation of Indian Chamber of Commerce and Industry (FICCI): People in business and industry are often members of local chamber of commerce, which can be a source of informal information and news about member companies and trade information generally. FICCI (<http://www.ficci.com>) established in 1927, has a membership of over 500 chambers of commerce, Trade associations and industrial bodies, it speaks directly or indirectly for over 2,50,000 business units including small, medium, and large units employing about 20 million people. FICCI has established Joint Business Council (JBC) in agreement with 68 counterpart chambers worldwide, to facilitate regular business-to-business interaction on regular basis. Specific services rendered by JBC include assistance for setting up joint ventures, finding sources of investment and technology and providing clearing house for business enquiries and information. FICCI is nodal point for Indian chapters of Confederation of Asian Chambers of Commerce and Industry (CASSI); G-15 Federation of Chambers of Commerce, Industry and Services (G-15 FCCIS); Indian Ocean Rim Business Forum (IORBF); International Chambers of Commerce (ICC); and SAARC Chambers of Commerce and Industry. FICCI-BISNET has launched 11 web portals to provide a wide variety of business information services.

www.bisnetworld.com: FICCI'S business information portal. It has a fully searchable database of 150,000 Indian companies. It offers a variety of business-to-business tools for interaction with Indian companies for business enquiries and for finding business partners. It contains free registration facilities for business enquiries, company profiles and calendar of events both for members and non-members.

PROWESS: Corporate database from CMIE (Centre for Monitoring Indian Economy. Website: <http://www.cmie.com>) providing information for 8000 companies. Database provides financial statement, ratio analysis, funds flow, products profiles, returns and risks on stock markets, etc.

www.agroindia.org : India's popular portal on agribusiness with information on Indian agriculture and post-harvest technologies and production guidelines for agro commodities. The site also hosts a large directory of Indian agricultural business companies under different subheads. Online Bulletin Board provides opportunities to post and search agricultural related business offers and enquiries online.

www.saarcnet.org : The site provides country profiles, trade and investment related policy and market information and business directories from all the countries in the SAARC region: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

www.cifti.com : The Confederation of Indian Food Trade and Industry (CIFTI), set up by FICCI in 1985, caters to the needs of Food Industry and Trade. CIFTI provides institutional support to food trade, hotel industry and processed food industries manufacturing almost all types of food and allied products, bread, biscuits and confectionery, beverages, meat and meat products allied industries like packaging, machinery, seed development, etc.

Company's Website: A web presence is very important for many companies. Most of the medium to large-scale Indian industries have their websites on the Internet. As the possibilities of Internet commerce widen, more and more companies will be using their websites as a shop window for their customers, thus improving information access to the business information professionals. So, for finding specific company related information, accessing the website is better, as it provides latest information about that company as compared to any printed source.

<http://trade-india.com>: A business-to-business portal, offering trade related information to business community in India and abroad. The website has comprehensive database of buyers and sellers from India and abroad. Provides three online trade directories i) Exporters Yellow Pages- (Available online and in print) — The directory consists of about 1,09,076 Indian exporters and manufacturers, covering wide range of products and services; ii) The Indian Importers Directory - (available online only) — A directory listing India's leading importers and iii) International pages- (available online only) — The directory lists over 12,600 International importers. The directory serves as a useful guide for Indian exporters and manufacturers looking for new market for their products abroad.

d) Handbooks and Manuals

Handbooks and manuals are important reference tools used by reference librarian to handle fact, data finding, and how to do type of technical enquiries. They are also extensively used by working engineers and technicians. They are sometimes known as guidebooks. The information is provided in compact and concise form but illustrated by various diagrams, graphs, equations, formulas, principles, symbols, tables, procedures, etc. They have limited scope because they deal with minute details of a specialised subject meant for small group of specialists. The number of handbooks in the field of engineering and technology is very large. McGraw Hill Companies (<http://www.mcgraw-hill.com>) and Chemical Rubber Company (<http://www.crcpress.com>) are the two most

prolific publishers of handbooks. More than hundred titles are published by them. Both the publishers have list of their publications on their respective websites. Many of their publications are available in print, CD-ROM and on the web. Both the publishers provide online registering, online ordering and online searching facility on their websites. Users can register with the publisher and whenever a new title is published in their field of interest, they are alerted by an e-mail message from the publisher. McGraw Hill professional e-Bookstore offers reference titles in business, engineering, architecture, aviation, computing and medicine. Chemical Rubber Company publishes handbooks in the field of biomedical sciences, chemistry, environmental sciences, forensic and criminal justice, pharmaceutical science and regulation, medicine, engineering, food sciences, information technology, mathematical sciences and physics. Chemical Rubber Company's CRCnetBASE has many online searchable databases for searching data and information on the above-mentioned subjects. (e.g. CHEMnetBASE, CivilEngineeringnetBASE, ElectricalEngineeringnetBASE, ENVIRONnetBASE, etc.)

e) Advertisements

Companies and other organisations issue advertisements to promote their products and services. Contents may vary from a mere listing of a product to detailed description of the product. The advertisements appear in trade journals, newspapers, books, radio, TV, and on the Internet. These advertisements particularly in trade journals sometimes give information on company's new line of development, establishment of a new department, or expansion of particular part of the firm, which can be useful for managers of rival companies. Most of the trade journals which include large number of advertisements, provide index to the advertisers and their addresses.

f) Patents

Companies engaging in a lot of research and development activities, will have need to protect their inventions by patenting them and would like to know about already existing patents of similar nature. A reference librarian can handle queries related to searching of published patents by referring to bibliographical tools used for searching the patents. But for drafting the patent specification or for commercialisation of a patented invention, the help of an expert who is well versed in drafting as well as in legal aspects of patents is required. These experts are known as Patents Attorneys. A list of patent attorneys is sometimes provided by telephone directories. For example yellow pages of Delhi Telephone Directory contains a list of Patents and Trademark Attorneys. Some of the sources for finding patents information are as follows:

Most of the countries have patent systems and laws empowering the government to grant the patent monopolies and publish the details of granted patents through an official publication. Indian patents are published in **Gazette of India, Part 3, Section 2**. It is a weekly publication. One of the Bibliographical tools for searching Indian Patents is INPAT. INPAT is a database on CD-ROM brought out by NISCAIR (formerly INSDOC). It is a bibliographical database providing information on 52,600 Indian patents granted in India from 1975 to 2002. The information comprises patent title, applicant and inventors names, patent and application number, application and publication dates, international classification code and country of the applicant.

The International Patent Documentation Centre (INPADOC) was established in 1972 with the support of World Intellectual Property Organization (WIPO) to provide a centralised bibliographic source for patent documents published throughout the world. INPADOC is now a part of the European Patent Information and Documentation System (EPIDOS) operated by European Patent Office (<http://www.european-patent-office.org>). INPADOC- EPIDOS databases are the largest patents databases in the world covering bibliography of all the patents applied and granted in 65 countries and

patenting organisations since 1968, consisting of over 33 million references. Wide range of services is provided through these databases. EPIDOS-INPADOC Patent Family and Numerical List (PFS/INL) is a database, which brings together patent publications with similar claims from a wide range of countries. The publications are sorted into “families”, so that the user can find out in what countries a patent for a given invention has been applied and granted. This makes it easier for companies to monitor the import export strategies of their competitors and to determine the countries in which the invention is not patented and can therefore be freely used. EPIDOS-INPADOC Patent Register Service (PRS): the PRS is a legal status database, which shows whether a particular patent is still valid, or has expired. This information helps in exploitation of inventions, which are no longer protected, and ensures that users do not pay unnecessary license fees for lapsed patents. Legal status information is provided for 22 countries. All legal status changes, before and after grant, is listed. PFS and PRS databases are updated every week and approximately 25,000 and 40,000 documents respectively are added to these databases every week. EPIDOS-INPADOC Patent Gazette (IPG) is an international gazette covering patent publications of over 50 countries and organisations. Documents are listed by patent number, applicant and inventor. Published on a weekly basis, the IPG contains details of all the documents processed in the previous seven days.

Intellectual Properties and KnowHow Informatics (Patents) Division (<http://patinfo.nic.in>) of National Informatics Centre provides online and offline patents information services. Services offered are bibliographic search, abstracts and full-text patent document service. Databases used for online searching are EPIDOS-INPADOC databases from European Patents Office, described above. The databases available on CD-ROMs are USPAT CD-ROM, CASSIS-BIB, CASSIS-ASSIGN, CASSIS CLASS and CASSIS-ASSIST. USPAT CD-ROM published by Derwent Inc., USA contains the bibliographic textual data of U.S. patents from 1975-94. All CASSIS databases on CD-ROM are from United States Patents and Trademark Office. CASSIS-BIB provides bibliographic information of all US patents issued since 1969. CASSIS-ASSIGN database contains bibliographic text from assignment deeds recorded at U.S.P.T.O. from August 1980 to the present. CASSIS-ASSIST provides additional search and information tools for searching US patents and CASSIS-CLASS deals with US Patents classification scheme.

EKASWA-A and EKASWA-B from Patent Facilitating Centre (<http://www.pfc.org.in>) of Technology Information, Forecasting and Assessment Council (TIFAC), are Indian patents databases on CD-ROM and Internet. EKASWA-A covers patents applications filed in India as published in the issues of Gazette of India (Part III, Section II) from January 1995 onwards. EKASWA-B covers Patents applications notified for opposition as published in Gazette of India (Part III, Section II) from January 1995 onwards.

g) Standards

Standards are essential to ensure the quality, reliability, and uniformity of a product, material, process or service. The manufacturers of products that have wide market as well as export potential always look for standards to ensure acceptability of their products within the country and abroad.

Standards and specifications are documents that recommend: i) Minimum level of performance and quality of goods and services; and ii) Optimal conditions and procedures for operations in science, industry and commerce including production, evaluation, distribution and utilisation of materials, products and services.

Standards are basically of two types: i) Fundamental standards; and ii) Technical standards. Fundamental standards are related to measurement of length, mass, time,

temperature, various forms of energy, force, or other forms of quantifiable fundamental entities that are basic to all scientific and technical practices. Technical standards are related to product, process, material or service.

Standards and specifications are formulated by: i) Companies; ii) Trade and Professional Associations; iii) Government Agencies; and iv) National and International Standardisation Bodies.

Queries related to standards are mainly for technical standards pertaining to product, material, process or service. Thus, the query may be for availability of standard on certain material, component, equipment, dimension of component, methods of testing, process of manufacture, code of practice i.e. procedures for installation, operation, maintenance, and other industrial operations to achieve safety and uniformity in such operations, etc.

Most of the queries related to the availability of standards can be handled by reference librarians using bibliographical tools brought out by the international, regional, and national standard bodies. In this section, brief description of these institutions and their products and services are listed.

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies from 148 countries, one from each country. Established in 1947, the mission of ISO is to promote the development of standardisation and related activities in the world with a view to facilitate the international exchange of goods and services, and to develop cooperation in the spheres of intellectual, scientific, technological and economic activities. ISO's work results in international agreements, which are published as international standards. ISO has brought out over 14,000 standards. Most of the ISO standards are highly specific to particular product, material or process, except ISO 9000 and ISO 14000 series of standards, which are 'Generic Management System Standards'. "Generic" means that same standard can be applied to any organisation, large or small, whatever is its product – including whether its product is activity or service- in any sector of activity, and whether it is a business enterprise, a public administration, or a government department. "Management System" refers to what the organisation does to manage its processes and activities. ISO 9000 is concerned with "Quality Management". This means what the organisation does to enhance customer satisfaction by meeting customer and applicable regulatory requirements and continually to improve its performance in this regard. ISO 14000 is primarily concerned with "Environmental Management". This means what the organisation does to minimise harmful effects on environment caused by its activities, and continually to improve its environmental performance.

ISO's entire portfolio of standards is listed in ISO catalogue which can be accessed online (<http://www.iso.org>). The site also provides access to the **World Standards Service Network (WSSN)**, which is a network of publicly accessible web servers of standards organisations around the world. It contains links to international, regional, national standardisation bodies and also other international and regional organisations, which develop standards in their specialised subject areas in addition to their principal activities. **ISONET**, the ISO Information Network is the world wide network of national standards information centres which have cooperatively developed a system to provide rapid access to information about standards, technical regulations and testing and conformity assessment activities in operation around the world. ISO together with IEC (International Electrochemical Commission) and ITU (International Telecommunication Union) has built a strategic partnership with World Trade Organization with the common goal of promoting a free and fair global trading system. WTO's agreement on Technical Barrier to Trade (TBT) include the code of good practice for preparation, adoption

and applications of standards. The code states, wherever International Standards exist or their completion is imminent; the standardisation bodies should use them as basis for standards they develop.

ISO Catalogue 2004: Lists all published ISO standards and other ISO publications issued upto 31 Dec. 2002 (updated annually).

ISO CataloguePlus 2004 on CD-ROM: This product contains information on all published ISO standards and other publications, plus the technical work programme of draft standards. The listings are presented by subject according to the International Classification of Standards (ICS). Standards are also listed in numerical order as well as under technical committee order. In addition, there is an alphabetical index and a list of withdrawn standards. (The CD-ROM product is published in English and French and is updated once in two months)

ISO also publishes the following two magazines:

ISO Focus (monthly): Presents an overview of ISO activities.

ISO Management Systems: The international review of ISO 9000 and ISO 14000 (published six times a year).

Bureau of Indian Standards (formerly, Indian Standards Institution established in 1947), the National Standards Body of India, is a statutory body set up under the Bureau of Indian Standards Act, 1986. Its aim and objectives include: i) preparation of standards related to products, process, material and service; ii) promotion of their adoption at national and international level; iii) certification of industrial products, processes, materials and services; and iv) promotion of standardisation, quality control and simplification in the industry. Indian standards are formulated keeping in view national priorities, programmes for industrial development, technological needs; export promotion, consumer welfare, health safety, etc. The Indian standards formulated and published by BIS are disseminated through following publications:

BIS e-Catalogue: BIS standards can be searched online through its website (<http://www.bis.org.in>)

BIS Catalogue 2004: Contains information on all publications of BIS issued up to 31 Dec. 2003. A subject index has been given at the end to locate the Indian standards on particular subject/theme.

Indian Standards on CD-ROM: Electronic version of Indian Standards. One has the option to buy the complete collection or separately to set(s) of standards covering different technical divisions.

Standards India: A periodical published monthly by BIS, providing write-ups on subjects of standardisation, technical interest and consumer interest as well as in-depth technical articles.

h) Statistical Sources

Many technical queries tend to seek information on industrial production, agricultural production or export and import data, marketing data, data reflecting various facts of Indian economy and so on. There are a number of statistical sources for finding answers to such types of queries.

In India, Central Statistical Organisation (Under the Ministry of Statistics and Programme Implementation) is responsible for coordination of statistical activities in the country. Its activities include National Income Accounting; Conducting Annual Survey of Industries; Economic Censuses; Compilation of Index of Industrial Production; Consumer Price Indices; Dissemination of Statistical Information, etc.

Some of the publications of CSO are as follows:

Statistical Abstracts, India Annual—Covers socio economic data such as area, population, climate, social condition, labour and employment, agriculture, production, irrigation, animal husbandry, forest, industries, trade and commerce, national income and expenditure, balance of payment, banking, insurance, exports and imports, education, etc. It contains national aggregates data for latest 3 to 7 years including data for the base year. The national aggregates are followed by State-wise data for the latest year and also reflect comparative development scenario amongst the States/Union Territories.

Monthly Abstracts of Statistics: Presents time series data for latest 2-3 years on key statistical indicators pertaining to various facts on Indian Economy.

India in Figures: Annual- Gives data on very broad and selected economic indicators for the last 3-4 years along with base year for comparative purposes.

Index of Industrial Production (IIP): Annual-Compares the growth in the general level of industrial activity in the economy with reference to a comparable base year. The current series of all-India IIP (base 1993-94) was released in May 1998. It covers Mining, Manufacturing and Electricity sectors. For wide accessibility by the users, the copies of Press Release on Quick Estimates of IIP released through Press Information Bureau are also put on the website of the Ministry (<http://www.mospi.nic.in>) on the day of release.

Annual Survey of Industries 1998-99 (in 2 Vol.): This is the principal source of industrial statistics in India.

Directorate General of Commercial Intelligence and Statistics, Ministry of Commerce (DGCI&S) brings out detailed foreign trade statistics of more than 10,000 export/import items on monthly and annual basis and has corresponding databases.

International Sources

- i) *Statistical Yearbook 1948 – N.Y.: United Nations Statistical Office*-. Provides statistical data regarding agriculture, manufacture, trade, etc.
- ii) *Statesman's Yearbook: Statistical and Historical Annual of the States of the World 1864-. London: Macmillan, 1864-*. Provides statistical summary of industrial production, trade, and commerce, transport, and many areas related to technical query.

II) Non-Documentary Sources

a) Consultants and Consultancy Organisations

The services offered by Consultants and Consultancy Organisations to industries fall within the scope of technical enquiry service. These services range from the feasibility study of setting up of an industry to the marketing of the products. Some of the important services offered are Feasibility studies; Market survey; Development plans; Site selection; Tender evaluation; Project reports and evaluation; Plant design; PERT/CPM; Construction supervision; Procurement and inspection of equipment; Process know-how; Training of personnel; Material management; Marketing and sales promotion; Plant maintenance; Plant modernisation, etc. The Consultancy firm may take up one or more of the above mentioned services or take up all the activities pertaining to the setting up of a new industry to the product development and its marketing as a turnkey project, depending upon the requirement of an industry.

In telephone directories of metropolitan towns like Delhi, Mumbai, Calcutta, Madras, etc. consultants are separately listed. For example, the yellow pages of Delhi Telephone

Directory lists a number of consultants under the heading “Consultants”. Similarly Infomedia Yellow Pages, Delhi Directory gives names and addresses of consultants under heading “Consultant” arranged alphabetically under 23 areas of specialisation. For example Consultants – Accoustical, Consultants – Computers, Consultants – Electrical, Consultants – Engineering, Consultants – ISO 9000/14000/TQM, etc. The Directory is available online as well (<http://www.yellowpages.co.in>). Published by Infomedia India Limited, Infomedia Yellow Pages (Business Directories) are simultaneously published for 12 cities in India. The directories are compilation of commercial information, classified over 3500 business headings ranging from abrasives to zippers.

b) Information Analysis Centres (IAC)

You have already learnt about the activities of IAC centres in Unit 4 of this Course. Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE), is an IAC which based on economic and business data of India, carries out research and brings out several information analysis products and services in different sectors of economy such as agriculture, energy and infrastructure, industry, corporate, capital market, investments, trade, etc. CMIE’s research and its databases are offered in the form of well-designed services. These are available in print as well as in electronic formats. Some of its services and databases are Business Beacon, Industry Analysis Service, Economic Intelligence Service, PROWESS (Corporate Database), CapEx (database on ongoing investment activities in India), India Trades, Mergers and Acquisitions, Indian Harvest, etc.

c) Patents Attorneys

Patents attorneys are legal experts on patents. They deal with all legal aspects of patents. They can help the inventor in drafting the patent application, filing the patent application, restoration of lapsed patents, for obtaining compulsory licenses or revocation and notices for surrender of patents. With their vast experience in handling patent documents, they can provide answers to many technical queries related to patents. Patents Agents are registered with the Controller General of Patents, Design and Trademarks (CGPDTM). Names and addresses of Indian patent agents registered with CGPDTM are published in the official gazette, newsletters, etc. of the Controller General’s publications and are also maintained in the “Register of Patent Agents” with the Controller General. The same can be accessed online on the website (http://www.iprindia.nic.in/ipr/patent/agen_list_04_pdf).

d) Trade Representatives

Trade representatives are often employed by various business concerns for promoting the sale of their products. These trade representatives visit the prospective buyers, distribute various products of the company, supply samples, give demonstration of the products, offer concessions, at times negotiate with the customer on the price of the product and other terms and conditions of supply, warranty, payment, annual maintenance contracts, etc. These trade representatives with their work experience, therefore, are able to provide answers to some of the technical queries related to product specifications, product demand and availability, consumers’ preferences relating to particular product, etc.

In brief, in this section we have defined technical enquiry and described information requirements of people in business and industry from where technical enquiries originate. The purpose and scope of technical enquiries and search techniques, manual as well as

computer-based have been outlined. Technical queries are answered with the help of documentary as well as non-documentary sources. Under documentary sources S&T periodicals, business periodicals, bibliographic and full-text databases, trade catalogues and directories, trade and business related websites, handbooks and manuals, patents and standards have been covered with relevant examples. In the non-documentary sources, role of consultants and consultancy organisations, information analysis centres, patents attorneys and trade representatives in answering technical queries have been highlighted.

12.5 DOCUMENT DELIVERY SERVICE

12.5.1 Definition

Document Delivery Service (DDS) is actually concerned with the supply of document(s) to the users on demand, either the original or its copy in print or non-print form, irrespective of the location and form of the original. Most of the information services such as current awareness service, SDI service, indexing and abstracting service, literature search service, etc. are aimed at guiding the users to the documents where required information is likely to be available. Whereas DDS actually locates the required document and supplies it to the requester either the original or its copy in print or in non-print form. DDS is an important service, since the value and importance of other access services are directly dependent on the efficiency of this service. For instance if a user, alerted by a current awareness service, requires a document and efforts are not made to supply the same to him/her in time, then the availability of any alerting service however efficient it may be, will have no value for him/her. Thus, DDS adds value to other information services.

Earlier DDS was mainly concerned with "lending" of a document to the user over a specified period of time by a library or an information centre from its own resources and if not available within the library, then borrowing it from other libraries on inter library loan and lending it to the user. With the introduction of xerography in mid 1950s and the large scale use of photocopiers in libraries by 1970s, the DDS was not just confined to lending or inter lending of documents, but documents could be duplicated and permanently supplied to the users. The libraries started using photocopier for the supply of copies of documents, particularly of journal articles and part of books. Most of the libraries still prefer supplying copies of journal article rather than giving the original, so that the original may always remain in the library and not get damaged with excessive use. The advent of computers, scanners and telecommunication technologies in 1980s made it possible to store the documents in electronic form and transfer the same electronically to long distances via telecommunication networks almost instantly. Now many libraries and information centres are using this technology for the delivery of documents to the intended users. This has greatly improved the speed of the service. Another trend is being observed, that is the availability of full-text electronic journals and books on the Internet by many publishers and aggregators, offering online ordering and instantaneous delivery of books as well as articles from the journals. The user can request an item directly from the publisher and receive the article at the location of his/her choice. The scope of DDS has expanded beyond the traditional libraries and specialised document delivery centres. The database producers, commercial online vendors, commercial publishers and e-journal service providers have also joined the document delivery market. The "ISI Document Solution" from Institute of Scientific Information, DIALORDER service from DIALOG, "Document Detective Service" from Chemical Abstracts Service (CAS) are some of the examples.

12.5.2 Need

Increase in Demand

The primary objective of any information system is to provide its users with timely access to the information they need so that it may be utilised by them to accrue maximum benefit. In recent years, due to advances in computer and telecommunication technologies the access to primary literature has vastly improved. A large number of electronic bibliographic databases accessible online as well as on CD-ROM in all the disciplines have emerged. The availability of these databases providing easy and timely access to published information has resulted in a great increase in demand for the original documents. Access to other libraries' online catalogues (OPAC) on the Internet, has further boosted up the demand.

12.5.3 Characteristics

The efficiency of DDS is determined by three factors, namely, speed, cost and satisfaction level. Ideally the DDS should be cost-effective, speedily delivered and should satisfy all the requests it receives.

Speed

The method of receiving the request and mode of delivery of documents directly affect the speed of DDS. Request may be received by post, telephone, fax, electronic-mail or online systems. Documents may also be supplied by any of the above mentioned methods. Of the above methods, online request and electronic delivery of document is the fastest, though delivery of documents in this way is expensive. However speed of supply of documents depends on many other factors such as, time taken to locate the document from within the institution, and if not available, then time taken to find its location, transmitting the request, processing the request by the supplying library, receipt of the document by the requesting library and finally delivering the document to the user. All these procedures affect the speed of the service. If the service is operated from a centralised collection, the delivery is quick, ranging from two hours to two days. With the availability of online databases, online public access catalogues, etc., it is possible to search for information from remote locations on the networks, request the selected document and receive the required document electronically almost instantly. Electronic document delivery systems offer a great promise. Here speed is the major attraction. However, copyright issues and high costs are some of the constraints, which are attracting worldwide attention.

Cost

DDS should be cost-effective. In devising a cost-effective service, all types of costs viz. direct as well indirect costs should be taken into consideration. Direct cost is cost of operating the service i.e., cost of processing the requests, copying the document, postage, etc., while indirect cost includes cost of building and maintaining the collection, salaries of staff, cost of equipment, etc. The service is more cost-effective if it is offered from a centralised collection and the number of requests is very large. Conversely, it is less cost-effective if it is offered from a decentralised collection. It is increasingly being realised that the service can be more cost effective if it is operated from building a core collection to meet primary needs of the users and for residual requests, accessing the material speedily from external sources electronically.

Satisfaction Level

Ideally, the DDS should satisfy all the requests it receives for the supply of documents. However, in practice this target is not achievable even from the most

comprehensive centralised collection. In general, a satisfaction level of 90-95 per cent is recommended and considered very good. A high satisfaction level depends not on the availability of the required document in the centre that offers the service but also on the ability of the centre to locate and supply it from elsewhere in the world as quickly as possible.

12.5.4 Types of Document Delivery Systems/Models

As mentioned in the preceding section, availability of electronic bibliographic databases providing 'instant' access to information and easy access to library catalogues (OPAC) around the world on the Internet have not only increased the demands for original documents but have increased user's expectations for early as well as cent per cent delivery. On the other hand exponential growth of published literature, increasing cost of publications and declining library budgets have been making it more and more difficult for libraries to meet the demands of their patrons from their own resources. Libraries have been finding ways and means to meet the demands of their users despite these limitations. Some of the efforts made by the libraries are improvement in inter library loan services, resource sharing among libraries of common interests, development of specialised document delivery centres, and more recently of joining library consortia to provide access to full-text electronic resources to their patrons. In this Unit you will study how DDS has changed over a period of time and what are the recent trends.

There are a number of national document delivery centres operating in the world providing document delivery service in a planned manner. Some of these centres operating in different countries are British Library Document Supply Centre (BLDSC), Boston Spa, U.K.; Institut de l' Information Scientifique et Technique (INIST), France; National library of Medicine (NLM), U.S.A.; Canadian Institute for Scientific and Technical Information (CISTI), Canada; and NISCAIR (National Institute for Scientific Communication and Information Resources, Formerly INSDOC), New Delhi, India. These centres offer the service drawing upon resources ranging from comprehensive centralised planned collection to decentralised unplanned collection.

A number of national document delivery service models have also been suggested by information workers in the field. Four basic national models suggested by Line (et al) in 1980 in UNESCO document are: i) A dedicated centralised collection, ii) Concentration on a few libraries, iii) Planned decentralisation, and iv) Unplanned decentralisation. In 1984 Vickers and Line described six types of models in an IFLA UAP programme document. These are: i) Dedicated centralised service, ii) Central shared service, iii) Concentration on a few libraries, iv) Decentralised planned provision, supply and retention, v) Decentralised unplanned access, and vi) A regionally based system. In a conference on Inter Lending and Document Supply held in London in 1988, Hope E.A. Clement (International Conference on Interlending and Document Supply (1988: London)) suggested following six composite models: i) A centralised lending collection, ii) A centralised lending collection with backup libraries, iii) A national lending centre, iv) A network of interlinked networks, v) Separate networks, and vi) Unlinked and total decentralisation.

These variant models/systems have been suggested because of the introduction and use of new technology. All these models have their own merits and demerits. The extreme models i.e. completely centralised and completely decentralised models are not very efficient. Because in the former case cost of building and maintaining centralised collection in terms of stock, staff, equipment, etc. is very high and it also leads to unnecessary duplication of resources, while in the latter case i.e.

service from unplanned decentralised collection, the speed of the service is affected. The service is more efficient if it is operated from a strong centralised collection with some backup libraries like British Library Document Supply Centre.

12.5.5 Examples of Document Supply Centres

British Library Document Supply Centre (BLDSC)

BLDSC (<http://www.bl.uk/services/>.) is an example of partially centralised model with some backup libraries. It handles on an average 14,000 requests per day and over 90% of them are satisfied. Over 87% requests are filled from BLDSC's own collection, 2.4% from backup libraries in U.K. and 0.3% from location outside the country. Most of the requests are processed within 2 hours (for 2-hour service) to 2-5 days (for standard service) from local collection. Delivery for standard service is by mail, courier, fax or Ariel within 2-5 days of receipt. While for 2-hour or 24-hour delivery, the documents are delivered by fax or Ariel. British Library collection covers all subjects and languages and include books (over 3 million), journals (over 260,000 titles), technical reports (5 million), patents (50 million), conference proceedings (433,000), musical scores and dissertations. The whole collection is international with 30% published in U.S. and 70% of the total stock collected from outside U.K. Its 74% requests are related to S&T. Of these 67% are for serials, 22% for monographs, 11% for conferences, theses, music and official publications. Many other major commercial suppliers (e.g. Research Libraries Group's CitaDel, UNCOVER, etc.) use BLDSC as a resource due to its excellent collection. Automation has been progressing at BLDSC which includes, among other things, scanning and digitisation of print and microform resources for document delivery purposes. One of the services offered from its electronic collection is "**Inside**". This is an integrated copyright fee paid document delivery and current awareness service. Offered since 1993, Inside provides online access to table of contents of 20,000 highly used journals of BLDSC, together with title level information for 250,000 journals held in British Library. It also includes details of papers from over 70,000 conference proceedings. The service allows to search and order directly over the web and receive article within as early as 2 hours. Another service, "**Secure Electronic Delivery**" service, provides fast access to over 100 million documents that are available for digital scanning. Almost anything from library's huge catalogue collection whether digital, in print, or in microform can be delivered electronically to the requester's desktop within 2-hours, if requested. The Secure Electronic Delivery Service, started in December 1, 2003, is based on Adobe Reader 6.0 software and **Relias** international scanning and delivery technology. On receiving the request the document is scanned and sent as encrypted PDF (Portable Document Format), which the requester can download, from British Library server within 14 days. British Library sends an e-mail message to tell the requester that the document is available. The electronic copy is available for collection from BL server for 14 days after which the file is deleted. The requester can make a single paper copy from electronic copy. Since, BL was the first one to launch the world's fully copyright compliant secure electronic document delivery service for digital documents in December 2002, it succeeded in obtaining extensive agreements for "secure electronic delivery" with many of the world's leading scientific publishers for digitisation and electronic delivery of documents from its entire paper based or microform collection.

Document Delivery Service of NISCAIR (Formerly INSDOC)

INSDOC (NISCAIR since 30 September, 2002) has been offering DDS at the national level since its inception in 1952. This service is based on the decentralised collection of resources held in major libraries in India including National Science Library and Electronic Library of NISCAIR. The requests are received by mail, fax or e-mail. The location of required document is identified by using the computerised Union Catalogue of Scientific Serials in India (NUCSSI), compiled and maintained by

NISCAIR. NUCSSI database contains serials holding information of about 850 science libraries in India. When requests for document delivery are received, they are sorted out on the basis of availability of source documents. Firstly the requests are serviced from NISCAIR's own library collection, then from Delhi based libraries and finally the requests are met from other libraries from India or foreign countries. Some of the important Delhi based libraries utilised for document delivery purposes are Indian Agricultural Research Institute Library, National Medical Library and Delhi University Library. Requests are received from universities, industries, R&D centres, from foreign countries and from individuals. Maximum number of demands (over 80%) is for journal articles. Another form of document delivery service offered by NISCAIR is Contents, Abstracts and Photocopy Service (CAPS). Under CAPS service, subscribers receive tables of contents of selected journals (15 titles for individual subscription and 30 titles for institutional subscription) every month from a list of 7500 Indian and foreign periodicals. CAPS service is available to subscribers on paper, through e-mail and on diskette. On browsing through the contents, users can place order for abstracts or copies of full paper. Users also have an option to place a standing order for abstracts of all the articles appearing in one or more chosen journals through Standing Order Abstract Service (SOAS). By subscribing to CAPS and SOAS, libraries can keep their users abreast of contents of latest journals of their interest at a nominal cost. Users on browsing the contents can place order for full copies of paper, which are provided under Document Supply Service of NISCAIR.

E-journals Consortium: NISCAIR is the nodal organisation for developing a "Consortium for CSIR laboratories for accessing e-journals". The activity, range from creation to monitoring the access facility of scientific periodicals published by international institutions. To start with, an agreement has been signed with M/S Elsevier Science publisher for 4 years to provide online access to 1500+ full-text e-journals through Science Direct to all CSIR scientists in 38 CSIR laboratories. The scientists can search, view and download articles for R&D purposes. The genesis for setting up e-journal consortium for CSIR laboratories goes back to year 2001. CSIR is a network of 38 R&D laboratories in the field of science and technology. For R&D purposes laboratories were subscribing to foreign S&T periodicals. Till 1993 CSIR laboratories were acquiring 8000+ foreign periodical titles of which 6000 were unique i.e. acquired by a single laboratory. Due to rising subscription cost of foreign periodicals and severe budget constraints, the CSIR laboratories had to cut down the subscription to many important S&T periodicals. By the year 2000 the subscription to periodicals came down to 3356 titles of which 2500 were unique titles. With the availability of full-text e-journals on the Internet and the growing demands of research scientists for access to these periodicals, an informal meeting of the heads of library and information centres of these laboratories was held in the year 2001 to find out solution to this problem. Following the meeting, a Study Group was set up under the Chairmanship of Director, INSDOC (Now NISCAIR). The Study Group submitted the report suggesting that an e-journal consortium should be set up to meet R&D information needs of CSIR scientists. To begin with, an agreement may be made with the publishers to provide access to full-text e-journals to all the CSIR scientists. The proposal was submitted to Planning Commission for 10th Five Year Plan 2001-2006 on October 2001. The proposal was accepted. To begin with an agreement was signed with Elsevier Science publisher on June, 2002. CSIR labs at present are subscribing to 550 print journals. By paying 9% additional cost on the subscription cost of print journals, all the scientists in 38 CSIR laboratories have now unlimited access to 1800 full-text e-journals of Elsevier Science. The NISCAIR serves as a nodal agency, dealing with publishers and CSIR laboratories, monitoring the usage statistics etc. It has been observed that over 1400 (70%) of these e-journals are being accessed by the scientists for their study and research. With the success of this Consortium, it is planned to increase the access to 3000 more e-journals from 11 publishers.

Self Check Exercise

3) What do you understand by e-journals consortium? Discuss with examples.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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12.5.6 Electronic Document Delivery Systems

The system employing electronic technology for the receipt of requests and supply of documents are known as Electronic Document Delivery Systems (EDDS). “Inside” and “Secure Electronic Delivery” of BLDSC are examples of EDDS. In this section you will study some of the EDDS operating in the world.

In most of the Document Delivery Centres, maximum demand (ranging from 70% to 80%) is for journal articles. This is because; the scholarly journal is considered the most preferred medium for publishing the R&D results by the researchers. The scholarly journal and its associated services such as current awareness services, indexing and abstracting services are undergoing significant changes due to electronic publishing and the Internet. The emergence of e-journals has made most significant impact. Traditional publishers are making available electronic version of their journals on the Internet. New generation of **e-journal service providers** have emerged. These include aggregators like Ingenta and Catchword, subscription-cum-aggregation agencies like EBSCO, portal-cum-aggregation services like Biomednet, bibliographic-cum-document delivery service like Infotrieve and Proquest online information service. Citation linking, across journals, and from bibliographic to full-text articles, has been another major development. New pricing models like pay-per-view and transaction-based models are emerging.

Article Delivery Over Network Information System (ADONIS)

ADONIS, a full-text, CD-ROM storage and retrieval system is widely known example of an electronic document delivery product, initiated and developed by a consortium of biomedical publishers. ADONIS started as a trial project. Ten international publishers, concerned about the widespread photocopying of their material, developed an optical disk system to create journal archives for sale of single article on demand. By joining together, the publishers were able to provide a comprehensive service for frequently requested titles in the field of biomedical and life sciences. In ADONIS process, the journals were scanned as soon as they were published. The machine-readable images were stored on CD-ROM, which were shipped to participating libraries and document delivery centres along with cumulated indexes for searching the articles. ADONIS also supplied two sets of software, one for article retrieval management and other for generating the statistics of usage. ADONIS system provided on-screen page browsing as well as printing facilities. Libraries receiving CD-ROM disks searched the articles on their personal computers (PC/AT) with compatible CD-ROM drive and laser printer. The required article thus printed could be sent to the requester by mail or by fax. The printing was automatically monitored on site in the libraries and a quarterly report generated and sent to ADONIS on floppy disk to be decoded for per article billing. ADONIS was commercially launched in 1991, after 10 years of development. By the middle of 1997, ADONIS was providing full-text articles of 850 biomedical

journals from over 70 publishers to the subscribing libraries. The annual subscription fee was about 16,000 U.S. dollars. ADONIS stopped this CD-ROM product sometime in the year 1997. The availability of full-text journals on the Internet providing wide range of options such as online searching, viewing and ordering the electronic delivery of single article and paying-per-article basis, probably led to the closure of this product.

Inter-Library Loan Service of Online Computer Library Centre (OCLC ILL)

The Inter-library Loan Service of OCLC, is world's largest online computerised ILL service used by over 6928 libraries, resource centres and document suppliers around the world. OCLC, an online library network was set up in 1969 in USA to facilitate co-operative computerised cataloguing. Over the years the number of libraries increased and size of its online union catalogue (called **WorldCat**) grew many folds. At present WorldCat, a worldwide union catalogue created and maintained by 9000 member institutions, has over 52 million records. As WorldCat grew, the combination of bibliographic records and library holdings made it a useful resource for inter lending purposes as well. OCLC started its OCLC ILL subsystem in January 1979. At present more than 45,000 libraries in 84 countries around the world use OCLC services to locate acquire, catalogue, lend and preserve library materials. OCLC ILL system handles about 8 million requests a year. OCLC ILL is fully automatic networked borrowing and lending system. A borrowing library sends an on-line request to potential lending libraries. Each lending library in the system has a total of 4 system days to respond to the request before it is passed on to the next lending library. The ILL system, as on-line communication mechanism, automatically forwards the request in turn to the next lender until the request is fulfilled. After agreeing to supply the item, the lender adds to the ILL record information concerning the restriction of use of loaned item, the mode of delivery, due date and instructions, charges to the borrower and any special notes about the loan. The request, thus, does not get blocked in the system while the lender does nothing. In terms of level of service, as the system is library-to-library, this is negotiated between borrower and lender. Generally turn around times are quick, although, may be slower for international loans. OCLC pricing is based on the transaction. There are two pricing issues: The cost of ILL (which is between libraries), and OCLC system cost. OCLC charges on transaction bases, so libraries only pay as they use the system. OCLC ILL Fee Management software tracks and reconciles ILL charges automatically and sends the bill to the concerned library. OCLC ILL is integrated with OCLCs **FirstSearch** reference service (providing access to over 60 databases) as well as **WorldCat**. The overall satisfaction rate is 95%.

OCLC **ILLiad** is web-based resource sharing management software, which automates routine inter library loan functions, manages borrowing, lending, and document delivery of journal articles through a single window based interface. It has seamless, integrated interface to both, WorldCat and OCLC ILL. It is also integrated with OCLCs FirstSearch search service and ILL Direct Request Service. Library users can send request directly and track the request electronically through the web. ILLiad processes requests and contacts users when request is completed and delivers documents to users desktops electronically. It generates detailed reports in real time that helps users to track the workflow. Lending reports help the borrowing libraries to view up-to-date tracking information sent through online systems. Copyright management system in ILLiad software allows inter-library loan staff to track and monitor all user-based requests for journal articles. ILLiad can send and receive request through National Library of Medicine's DOCLINE and ISO ILL. The inter-library loan staff of Virginia Polytechnic Institute and State University developed OCLC ILLiad software. It has been expanded and enhanced by Atlas Systems Inc. Atlas continues to be provider to OCLC for support and development of this software product. (<http://www.oclc.org/>)

DOCLINE: ILL System of National Library of Medicine, USA

DOCLINE is National Library of Medicine's (NLM) automated inter-library loan (ILL), request and order referral system. The system was developed to improve DDS by linking journal holdings of National Network of Medical Libraries (NN/LM) by routing requests quickly throughout the network. NN/LM is a network of health science libraries and information centres throughout U.S. Requests can be created, edited, routed, received and filled in by using the DOCLINE system. DOCLINE participants can also check the status of their requests for which they are either the borrowing or lending library. DOCLINE covers over 3200 U.S., Canadian and Mexican Medical libraries at no cost. DOCLINE consists of three main functions: i) DOCUSER- user institutional information including address, contact name, ILL services, NN/LM membership information and routing tables; ii) SERHOLD- journal holdings information. SERHOLD contains over 1.4 million journal holdings of about 3200 libraries; and iii) REQUESTS- the functions of borrow, lend and status/cancel. Each DOCLINE member library receives quarterly summary reports on its activities as a lender and as a borrower. These reports are available online. The Electronic Fund Transfer System (EFTS) is a billing system used by medical libraries in U.S. and Canada. Participants establish an account with University of Connecticut Health Centre. Lenders upload billing data for DOCLINE or other transactions. Their accounts are credited and borrower's accounts are debited. Lenders pay a 3% fee of the amount collected. EFTS has virtually eliminated the need to create invoice and write cheques for reimbursement for ILL and document delivery between participants. EFTS generates monthly transaction reports, can handle variable charges and non- DOCLINE transactions.

PubMed service of NLM, USA provides access to over 15 million citations for biomedical articles dating back to 1950s. The citations are from MEDLINE and additional life science journals. PubMed includes links to many sites providing full- text articles and other related resources. PubMed Central (PMC) is free digital archive of biomedical and life sciences journal literature maintained by NLM. All journals in PMC provide free access to full- text articles. One can use PMC OAI Service to download XML for the full-text open access articles and PMC FTP Service to download a complete set of files – XML, images, PDF and supplementary data files if any. A list of 92 open access journal titles is available on the site.

Relias is electronic document delivery and ILL management system used by the National Library of Medicine and National Institute of Health. Relias International Inc. provides systems and software to automate and streamline operations in traditional ILL and Document Delivery Services. Documents are scanned and automatically delivered by the system via the borrower's requested delivery method. Delivery options include Ariel, E-mail, Fax, Mail and Web. Electronically delivered articles can be supplied in either PDF or TIFF format. (<http://www.nlm.nih.gov/>)

E-Journal Service Providers

The availability of full- text electronic journals on the Internet has changed the document delivery scenario significantly. Full-text e-journals on the Internet provide a wide range of options for the user, ranging from searching the bibliographic databases, selecting the retrieved citations, viewing the relevant article(s) to the delivery of the article(s) electronically on the user's desktop. The publishers either themselves are providing their e-journals on the Internet (e.g., SpringerLink and ScienceDirect from Springer-Verlag and Elsevier Science publishers) or making them accessible through e-journal service providers (EBSCO, Infotrieve, Proquest, etc.). This section provides a brief account of such services available on the Internet.

ScienceDirect (<http://www.sciencedirect.com>): Launched since 1997, ScienceDirect has evolved from web database of Elsevier journals to one of the world's largest providers of scientific, technical and medical (STM) literature online. ScienceDirect provides online access to about 1900 full-text (STM) journals, 12 bibliographic S&T databases (like MEDLINE, BIOBASE, BIOSIS Previews, EMBASE, COMPENDEX, INSPEC, etc.) and over 27 reference works (S&T Encyclopaedias and Dictionaries). **ScienceDirect Web Edition** service, provides subscribers to browse all Elsevier journals available on ScienceDirect platform, link to table of contents and access abstracts. Link from abstracts to full-text article(s) is provided for most Elsevier journals and subscribers can download full-text articles in PDF or HTML format on their desktop. Nearly 6 million articles are available online, including articles in press which offer rapid access to recently accepted manuscripts. The coverage includes 1800 journals published by Elsevier and dynamic linking to journals published by other 170 STM publishers through **CrossRef** (a Publishers' Consortia). Elsevier publisher offers a variety of subscription and access options to libraries and information institutions, such as *ScienceDirect Onsite*, *ScienceDirect Limited*, *ScienceDirect Complete*, *ScienceDirect Article Choice*, etc.

SpringerLink (<http://www.springerlink.com>): This is online information service for scientific, technical and medical journals and books from Springer-Verlag publisher. Springerlink currently offers to the subscribers online full-text access to 500 (as on September 2004) STM journals and over 2000 book series. Free access is provided to search functions, table of contents as well as keywords and table of contents alerts. SpringerAlert is free of charge service that notifies users via e-mail whenever a new article or journal is electronically available. It sends table of contents and provide direct link to the abstracts. Users can sign up for *Table of Contents Alert*, *Keyword Alert* and *Subject Alert* also. *Onlinefirst* service provides users to access peer reviewed articles well before print publication. Users can also expand their search with reference linking found within articles in SpringerLink by clicking on references within the article. Springerlink also offers a pay-per-view option to non subscribers for its journals and some book series articles.

J-Gate (<http://www.informindia.co.in>): J-gate is an electronic gateway to global e-journal literature. Launched in 2001 by Informatics India Ltd., J-Gate provides access to over 4 million articles of e-journals available online. It has a database of journal literature indexed from 11880 + e-journals with links to full-text articles at publishers' sites. J-Gate presently hosts contents of 11800 + e-journals, provides access to 820 online journals and captures and indexes articles from 2910 open access journals and maintains link to them. J-Gate offers two types of services: i) **J-Gate Portal** and ii) **J-gate customized services**. J-Gate portal service provides table of contents of latest issues of journals and a comprehensive online searchable database of over 4 million articles with daily addition of over 4000+ articles. Table of Contents (TOC) provides link to full-text articles at publishers site. Presently link to e-journals from over 3500 publishers are available. J-Gate customized services offer J-Gate Custom Content (JCC) and J-Gate Custom Contents for Consortia (JCCC). JCC is local Intranet/Internet solution to libraries providing e-access for subscribed journals. The service provides TOC and database service to all the journals subscribed by the library. Customised software is installed at library's premises. TOC and database contents are updated weekly. JCCC service is for homogeneous group of libraries that wish to share resources. JCC software is installed at participating libraries. Common TOC and database service is provided to all the libraries, which have formed a consortium, and provides link to union catalogue for resource sharing. E-mail request for article delivery can be sent directly by the user while browsing articles/abstracts to any chosen library

participating in the consortia. J-Gate plans to support online subscription to journals, electronic document delivery, and archiving and other related services.

Infotrieve Inc.'s Document Delivery Service and Ariel: Infotrieve is a commercial company providing research information services to corporations, academic institutions, and professionals engaged in R&D activities in science, technology and medicine (STM).

Company's services include full-text document retrieval and delivery service, outsourced library services such as contract staffing and specialised library management and software application for document ordering, management and electronic delivery. The company's databases include *ArticleFinder*, *eContents*, *Table of Contents (TOC)*, and alerting service such as Table of Contents alert. In addition to that it provides links to MEDLINE, PubMed, Ovid, Silver Platter, and Web of Science through gateway. *ArticleFinder* database provides access to over 26 million articles. *eContents* database contains journal titles available for electronic article delivery. TOC is database of journal titles, which offer table of contents for over 21000 titles. Users using bibliographic citation and abstract databases and alerting services can order full-text article in paper or electronic form on a pay per article basis. Infotrieve offers multiple payment options including standard credit card payment, through deposit account or through invoice account. Cost per article includes service fee (varies from 12 to 14 US \$) plus royalty charges and delivery charges. Delivery options are through mail, e-mail, Ariel, Fax or Courier services. **Ariel** is an Internet document transmission system owned and supported by Infotrieve, Inc. The Ariel was originally developed by Research Library Group as a component of its "Shared Resources Program" (now called SHARES) after a beta test in 1990-1991 at 6 sites, it was released for sale and now being used worldwide for electronic document delivery purposes. As a part of a "Document transmission workstation" which includes IBM compatible microcomputer, scanner and laser printer, Ariel software permits user to scan, store, transmit, and print material. With the Ariel software an article in a paper journal can be scanned into PC and the image transmitted over the Internet to the other Ariel workstations anywhere in the world-using FTP or e-mail and convert them to PDF for easy patron delivery. Infotrieve has announced the release of Ariel version 3.4 (<http://www.infotrieve.com/ariel>), which has many additional features compared to the earlier versions of Ariel.

EBSCO Information Services (<http://www.ebsco.com>): EBSCO Information services is a division of EBSCO Industries Inc., providing information access and management solutions through print and electronic journal subscription services, research database development and production, online access to more than 100 databases and thousands of e-journals and e-commerce book procurement. EBSCO has specialised products and services for academic, medical, government, public and school libraries as well as corporations and other organisations. EBSCO maintains comprehensive database of more than 282,000 serial titles and has active relationship with over 60,000 publishers worldwide to distribute their products. **EBSCO host Electronic Journal Service (EJS)** handles electronic journals access and management needs of a library such as tracking the registration status of e-journals, authentication, assistance to facilitate both on campus and remote access to e-journal contents, automatic management of e-journal URLs, etc. EJS enhanced serves as a consolidated gateway that allows users to search and link to more than 10,000 journals and 5 million articles with desktop delivery. Access to TOCs/Abstracts of non-subscribed journals is also provided. Pay-per-view article purchasing option is available for more than one million articles. A basic version of this service is also offered to a library with a single site for accessing those journals to which the library subscribes through EBSCO. **EBSCO A to Z** service provides library patrons with a single comprehensive list of electronic journal titles. The Master A to Z database provide link and coverage information for 55,000 unique

titles from more than 600 databases and e-journal packages from approximately 100 different providers. All major database vendors and publishers are represented. Free online journals (such as PubMed Central) and stand-alone e-journals are also included. The list is hosted on EBSCO's web servers requiring only a single hyperlink to the list on subscribing library's website. Pricing for EBSCO's A to Z service is based on number of unique titles (print or electronic) on the library's list. Several discounts are available.

ProQuest Information and Learning (<http://www.proquest.com>): ProQuest Information and Learning is a subscription based service from ProQuest Company, providing web access to more than 4000 newspapers and periodicals, many updated daily, and containing full-text articles from 1986. In addition, the ProQuest offers over a million of Doctoral and Master's dissertations (full-text) in print, microform or digital form and more than 100 products and services including indexing/abstracting services and full-text databases, for research and learning at all levels. These products and services are specifically designed for the needs of school, university, public library, government departments and companies around the world. Currently students, faculty, researchers and library patrons from U.S.A., Canada and 100 other countries, are using ProQuest services at the rate of 2.5 million page views per day. The UMI (formerly University Microfilm International) was the first commercial publisher of microforms, which provided microfilm version of scholarly publications to libraries for archival purposes and document delivery. Bell & Howell's acquisition of UMI in 1985, propelled company's expansion from microforms to electronic access products, first with CD-ROM products, and later with web-based *ProQuest Information Service*. In 2001, in recognition of ProQuest name and strength, Bell & Howell changed its name to ProQuest Company and UMI division became ProQuest Information and Learning.

12.5.7 Role of International Organisations in DDS

Copyright issues, inter-library lending (ILL) at national and international level, incompatibility of ILL protocols for electronic document delivery and restrictions imposed on the storage and delivery of documents electronically by publishers are some of the problems faced by DDS operators. International Convention on Copyright and Universal Convention on Copyright, of which India is also a signatory, acknowledge the exclusive rights of authors or publishers over their literary work, but at the same time permit to make single copy of the document for educational purposes for the benefit of the users. However Copyright laws in relation to electronic media are ambiguous and are continuously changing. To prevent unauthorised use and exploitation of electronic material, most of the publishers are selling their e-publications under licensed agreement. The license agreements have rigid clauses, which impose number of restrictions on the library on the use of these e-publications. These problems are discussed at international forums and many international agencies are actively involved in finding solutions to them.

Internationally, IFLA (International Federation of Library Associations and Institutions) under its Universal Availability of Publications (UAP) Programme and Office for International Lending, has been promoting the availability of publications. It issued standard request forms for ILL, issued voucher scheme to facilitate overseas international inter library loan transactions, and published guidelines for international lending. The Guidelines, "*International Lending and Document Delivery: Principles and Guidelines for Procedure*" were important step forward in attempting to establish key standards for inter-lending between countries. The guidelines were first published in 1954; they were revised in 1978 and again in 2001. Under **IFLA's Voucher Scheme**, IFLA issues plastic vouchers for US \$8 and US \$4 to facilitate international inter-library loan transactions. Libraries purchase and use these vouchers for paying inter-library loans or photocopies. Vouchers are valid indefinitely and can be used again and

again by participating libraries. Libraries, which accumulate vouchers by doing more lending than borrowing, can redeem vouchers from IFLA for original purchase price with no administration fee. The IFLA voucher scheme was launched in 1995 and has continued to expand ever since. This is, because, it avoids involving library's finance department in ILL payments, gives libraries far greater flexibility in making ILL requests, and helps them to overcome the difficulties in sending small amounts of money overseas for ILL, which include lack of access to hard currency, high banking charges, exchange difficulties and administrative costs. IFLA Office for UAP and International Lending was setup in British Library, Boston Spa in 1974, and closed at the end of March 2003. With the closure of the office, the management of IFLA voucher scheme has moved to IFLA headquarters in The Hague. The value of existing vouchers has changed from US \$8 and US \$4 to Euro8 and Euro4. All the vouchers in circulation, however, remain valid and can be used in the usual way. IFLA Committee on Copyright and other Legal Matters (CLM) represents the voice of international library community in copyright concerns. The Joint Steering Group of IFLA and IPA (International Publishers Association) promote common principles on copyright and electronic environment. IFLA Document Delivery and Inter-lending Section is the forum in IFLA for libraries and associations concerned with making information in all formats available throughout the world through a variety of resource sharing and document supply techniques. The Section's prime objective is to extend and improve document delivery and inter-lending, both nationally and internationally through the use of new technologies and increased cooperation among libraries. (<http://www.ifla.org>)

ISO ILL: The International Standard for Inter-library Loan: ISO ILL 10160 and 10161 are ISO standards for inter-library loan. These standards provide technical definition of messages as well as set of rules on how to use those messages between the systems. Many libraries that use multiple ILL methods, are implementing ISO ILL compliant systems, because they enable the libraries to manage all their ILL transactions in a single database. Depending on the system, this allows them to take advantage of other system features such as copyright tracking or searching bibliographic databases. (<http://www.iso.org>)

COUNTER (<http://www.projectcounter.org>): In recent years there has been growing awareness of the need for an international effort, involving vendors, librarians and intermediaries, to develop acceptable global standards for measuring online usage. Launched in March 2002, COUNTER (Counting Online Usage of Networked Electronic Resources) is an international initiative designed to serve librarians, publishers, and intermediaries by facilitating the recording and exchange of online usage statistics. In December 2002, COUNTER released a *Code of Practice* that provide among other things, guidance in data elements to be measured, definition of these data elements, usage report content and formats, as well as on data processing. COUNTER will initially focus on journals and databases. E-books and other types of material will be covered in subsequent releases of Code of Practice. COUNTER is developed with the joint efforts of library associations, publishers associations, NISO, etc. COUNTER will also establish an organisational framework and technical/business model for ongoing implementation and development of Code of Practice.

International Coalition of Library Consortia (ICOLC) is an informal organisation comprising about 60 library consortia in USA, Canada, UK, The Netherlands, Germany, Israel and Australia, promoting the interest of library consortia. The Coalition represents over 5000 member libraries worldwide. Recently the ICOLC has issued Statement of Current Perspective and Preferred Practices for Selection and Purchase of Electronic Information. It states that "Licenses should permit the 'fair use' of all e-information for non-commercial, instructional and scientific purposes by

authorised users, including unlimited viewing, downloading and printing in agreement with the provisions in current copyright practices as applicable in the country of origin. Providers should allow e-information (such as electronic copies of journal articles) to be used (to generate whether in print or electronic form) for non-commercial inter-library loan between two academic libraries in support of teaching, learning and research missions." (<http://www.library.yale.edu/consortia/icolcpr.htm>)

12.5.8 Document Delivery Service: Emerging Trends

Two contradictory trends in document supply are being observed. Firstly, libraries have option to purchase information in smaller units, like articles (of periodicals) rather than subscribing to these journals and this information can be obtained via document delivery, inter-library loan or pay-per-view download. Secondly, libraries are becoming part of library consortia for site licensing of electronic scholarly publications (Like e-journal consortium of CSIR), which is making increased amount of contents available to individual library, thereby reducing the need for document supply. Watts (2003) has identified first trend as "Separate Economy" and second as "Big Deal". National document delivery centres like BLDSC, CISTI in Canada and INIST in France are witnessing decline in requests for document supply. Cambell (2003) has identified three threats to future of document delivery centres: i) Journal Legacy, ii) Aggregated Databases and iii) The Open Archives Initiatives. "Journal Legacy"- The publishers are digitising their back runs of journals. This will reduce the demands for document supply from older journal issues by the patrons from document delivery centres. "Aggregated Databases"- Agencies like EBSCO and ProQuest, with license rights from primary publishers are providing online access to full-text online aggregated databases. They are also providing links from secondary services to the full-text article online. "The Open Archive Initiative"- availability of open access journals on the web like PubMed Centre are also reducing the demands for document supply. It is also felt that libraries may take the role of archiving material from its faculty and offer free access to research community over the web.

In brief, in this section we have described how document delivery is the culminating point of all the access services and plays a vital role in information access and dissemination. The meaning of document delivery service, need and essential characteristics of the service have been discussed. Various document delivery systems/models have been described. Highlighted how modern computers, telecommunication technologies, Internet and World Wide Web are exerting great impact on document delivery systems. Problems associated with document delivery services and role of international organisations in finding solutions to these problems have been highlighted.

12.6 TRANSLATION SERVICE

12.6.1 Need

One of the important characteristics of science, shared by scientific literature is its universality. Scientific laws, established by scientific methods of inquiry, irrespective of their place of origin or language, are universal. Thus, scientific truths, transcends political, sociological, cultural and linguistic barriers. The scientific literature, which embodies this knowledge, serves as foundation on which the progress of science rests. The results of scientific research, in whatever language they are published, have to be brought to the notice of scientists, as ready access to S&T information is the fundamental needs of scientists everywhere. An eminent American scientist is reported to have said after the launch of "Sputnik" by Soviet Union "Either we will have to learn physics, or we will have to learn Russian".

The results of S&T research are published in diverse languages in as many as 186 countries of the world. The Chemical Abstracts, monitors the chemical literature published in over 50 languages. The dispersion of S&T literature in numerous languages has been much of the concerns of the research scientists. No country, however advanced technologically it may be, cannot ignore the scientific information produced in other countries. It is estimated that, about 40% to 50% of the literature published in the world is in languages other than English. For instance, Union Catalogue of Research Library Group comprising of over 120 million documents, represents as many as 400 languages. Of these, 50% documents are in English language. Top 8 non-English languages (German, French, Spanish, Chinese, Italian, Japanese, Russian, and Latin) represent 33% of the RLG Union Catalogue. The above example shows, that large amount of information generated in the World is published in languages other than English and is not directly available to English speaking people. Major International abstracting and indexing services published in English, are constantly bringing to the attention of the scientists the relevant documents published in languages other than English. For the articles in other languages, the abstracting services provide abstracts in English language, so that the scientist may judge the relevance of the article and get the article translated if required. Similarly, for French and Russian speaking scientists, major abstracting services in S&T are “Pascal” in French and “Referativnyi Zhurnal” in Russian language.

12.6.2 Translation Process and Translator

In order to know the achievements of countries speaking different languages, we take the help of translators, to translate the document in the language we understand. Translation is a process of transferring precisely the information contents of the text in one language (L1) into another language (L2). The former is called the ‘Source Language’ (SL) and the latter is called the ‘Target Language’ (TL). In the translation process, the language expert analyses the given text in the source language from various view points, including grammatical-morphological structure of the sentence, semantic, syntactic, terminological aspects, etc. and comprehends the information contents of the sentence(s). The more precise the comprehension of the information content in source language, the more precise will be its transfer in the target language. If the translator fails to understand the message to be communicated, the information transferred into the target language will either be distorted or inadequate. A translator should have a good knowledge of the source language as well as of the target language. In addition, he/she should be a subject expert to understand the terminology of the given subject. Each discipline has its own peculiar jargons/terminology and style of writing. In order to understand information contents and the logic of the argument in the source language, the knowledge of the concerned subject field is necessary. Thus, the subject knowledge is an essential requirement, specifically for translating S&T documents.

12.6.3 Translation Services in S&T Institutions

Several government departments, public sector organisations and R&D institution have in house translation facilities to cater to their own translation requirements. The translation units are generally an integral part of Documentation or Information Centre of the organisation. Two kinds of translation services are organised within the Information Centre: i) In-house translation service to cater to the local translation requirements of the organisation from a few foreign languages into English, and ii) General translation service which provides translation services to any individual or organisation from large number of foreign languages into English or vice versa on payment basis, such as translation services of NISCAIR (formerly INSDOC).

Organisation and Management of Translation Services

The foreign language translation facility in an Information Centre can be organised in two ways:

- i) By in-house staff translators; and
- ii) By external panel of translators plus staff-translator(s) for quality control.

Before deciding on any of these modes, it is essential to assess the demands for foreign language translation. If the demand in each language is more than 1000 pages per year, and workflow is regular in nature, then it is economical to induct a full-time staff translator for that language.

In case, the demand for foreign language translation is occasional and for less number of pages, then it is desirable to get the work done from outside agency. For this purpose the Information Centre can either i) approach a central translation agency like NISCAIR or ii) have own panel of translators who can be contacted to provide translations on prescribed payment basis as and when the work is required.

However, getting the translation work done from professional agency like NISCAIR is advantageous since this centre has experienced staff translators and quality of translation will be better. Moreover, the rates of translation of such agencies are uniform for each and every customer.

Present Scenario of Translation Services in India

Several Government, Public Sector organisations, R&D institutions in science and technology have in-house translation facility to meet their own requirement for limited number of languages. Some such organisations are BARC, DESIDOC, ONGC, BHEL, MECON, HAL.

NISCAIR Foreign Language Translation Service

NISCAIR (Formerly INSDOC) has been providing translation services to S&T community since its inception in 1952. It caters to the translation requirements of National Laboratories, S&T Institutes, R&D Organisations, Corporate and Public Sector Undertakings, Universities, Research scholars, etc. NISCAIR provides translation of S&T documents from 20 foreign languages into English. Languages that include Chinese, Czech, Danish, Dutch, French, German, Hungarian, Italian, Japanese, Norwegian, Polish, Portuguese, Rumanian, Russian, Serbo-Croatian, Spanish, Swedish, etc. NISCAIR provides reverse translation (English into foreign language) also. Translation of English text of maximum of one page into French, German, Russian and Spanish is undertaken. Translation of full English document into Japanese is undertaken. NISCAIR also provides interpretation services in Japanese language.

The translation work is carried out by experienced staff translators and panel of translators registered with NISCAIR. Since, NISCAIR mainly deals with technical translations, most of the staff translators as well as panel of translators have post graduate level qualification in language as well as in subject disciplines. Selection of panel translators is based on rigorous selection process. The language (target as well as the source language) and subject proficiency of the applicant is examined by giving him/her different types of technical documents for translation. The person is registered on the panel if he/she delivers quality translation, adheres to allotted time schedule and delivers translation in required format. The newly enrolled members on the panel are given shorter translations, and these are thoroughly checked and edited by experienced staff translators. The panel of translators is continuously updated.

12.6.4 Translation Activities in Humanities and Social Sciences

The following organisations are actively involved in translation work in the field of humanities and social sciences:

- 1) The National Council of Educational Research and Training (NCERT) and National Book Trust (NBT) are both engaged in translation of textbooks in various Indian languages.
- 2) The State Council of Educational Research and Training carries out translation work from English into state languages or vice versa.
- 3) The Central Hindi Directorate, Hindi Academy and Sahitya Academy carry out translation work. The Sahitya Akedemy has also instituted a prize for the Best Translator.
- 4) The School of Foreign Languages (SFL), Delhi, conducts courses in Chinese, French, German, Japanese and Russian languages for defence personnel and sponsored candidates. The School also undertakes translation work.
- 5) The Central Institute of English and Foreign Languages, Hyderabad, and The Institute of Asian Studies, Madras conduct language courses and perform translation activities.
- 6) The Indian Council of Cultural Relations, Delhi carries out literary translations of books and other documents to project Indian cultural heritage to the world.

12.6.5 Bibliographical Control of Translations

Translation work by nature is an expensive and time consuming process and it requires a rare combination of skills including expertise in two languages and subject knowledge.

It is, therefore important for scientists and information professionals to be able to locate both existing translation and those that are in progress to prevent wasteful effort and expense of duplicate translation. The journal literature constitutes the bulk of translations. Over 300 scientific and technical journals are translated from cover to cover, mostly from Russian into English, by commercial publishing houses and by scientific societies. Following publications provide list of cover-to-cover translated journals:

Ulrich's Periodical Directory gives list of cover-to-cover translated periodicals.

Journals in Translation (1950+): Cumulated annually, this publication lists cover-to-cover translated journals and journals containing selected translated articles. Full entry gives the journal's original title, dates the translation covers, whether it is cover-to-cover or selective. Two indexes, keyword and original title index, are provided. Key to publisher or distributor is provided under original title index.

World Translation Index (WTI) (1987 to Dec. 1997) - It is an index to translations from all languages to Western European languages in all fields of science and technology, collected by the International Translation Centre (ITC), Delft, The Netherlands; The Centre National de la Recherche Scientifique (CNRS), France; and National Translation Centre, Chicago. WTI contains bibliographical references to both the original and translated documents and name of the organisation furnishing the translation and its availability. It covers published as well as unpublished translations. It contains translations of serial and non-serial publications. About 80% to 85% of the translations are for journal articles. The printed version of WTI published 10 issues per year with source and author indexes. The annual index consisted of source and author index. With the closure of International Translation Centre in December 1997, publication of WTI has stopped since then. Database of WTI, is available for online searching on

Dialog (<http://www.dialog.web.com/>). The data covered is from 1979 to Dec. 1997. The file size is over 476,000 records. Copies of the translation can be obtained from National Research Council of Canada, Document Delivery Section, Canada; BLDSC, Boston Spa, U.K.; or Delft Technical University, Delft, The Netherlands.

International Translation Centre (ITC) came into existence in 1961 under its former name European Translation Centre (ETC). The present name was assumed in 1975. The centre was established as a result of a wide scheme of co-operation amongst Western European countries stimulated by U.S. and guided by the Organisation for Economic Cooperation and Development (OECD). Its general aim was to act as an instrument for exchange of information by means of translations and prevention of duplication of translation work. The ETC acted as a referral centre, maintained a central information file, distributed translations, announced all translations in the monthly *World Index of Scientific Translations and List of Translations notified to ETC (1967-1977)*. The name of the publication was first changed to *World Transindex* in 1977 (1977 to 1986) and then to *World Translation Index* in 1987 (1987-1997). WTI centralised translation announcements collected by ITC, CNRS and National Translation Centre and replaced all former publications. At present many of the major translation centres are no longer in business. Reduction in funding for information services has resulted in significant decline in translations made on ad-hoc basis. The ITC had to work hard to locate material for citation in WTI and subscription to WTI also steadily declined over the years, leading to the closure of ITC in Dec. 1997.

Index Translationum: Published by UNESCO, Index Translationum provides bibliographical details of books translated in the World into English in all fields of knowledge. Each year, the bibliography centres or national libraries of the UNESCO member states (about one hundred), send UNESCO Secretariat, bibliographic data concerning translated books in disciplines such as literature, social and human sciences, natural sciences, art, history and so forth. UNESCO brings out Index Translationum in print annually and maintains machine-readable database containing cumulative bibliographical information on books translated and published in about one hundred of the UNESCO member states. The database maintained since 1979 has over 1,400,000 records. It is planned to update the database every quarter. (<http://portal.unesco.org/culture/en/...>)

12.6.6 Machine Translation

Machine translation (MT) is the application of computers to the task of translating texts from one natural language to another. In MT system, the computer program analyses the text in one language-the "source text" and then produces another equivalent text in another language-the "target text"- without human intervention. The translation process, as discussed earlier, involves de-coding the meaning of "source text" and re-encoding the meaning in "target text". However, behind this simple procedure there lies complex cognitive operation. For instance, to de-code the meaning of the text in its entirety, the translator must interpret and analyse all the features of the text, a process that requires in depth knowledge of both, the grammar, semantics, syntax, idioms of the source language as well as the culture of its speakers. The translator needs the same in depth knowledge to re-encode the meaning in the target language. Therein lies the challenge in MT system, how to program the computer to "understand" a text as a human being does and also to "create" a new text in the target language that "sounds" as if it has been written by a human. This problem has been tackled in number of ways. Generally the rule-based methods (such as lexical lookup method, grammar based methods, and meaning based methods), which parse

a text, creating an intermediary, symbolic representation, from which the text in target language is generated, have been found successful in machine translation. However, these methods require extensive lexicons with morphologic, syntactic, and semantic information, and large set of rules.

Systems for automatic translations have been under development for over 50 years. The first public demonstration of MT system was held in New York at the head office of IBM in 1954 the system itself, was no more than what today would be called a “toy” system, having just 250 words and translating just 49 selected Russian sentences into English in the field of chemistry. This demonstration stimulated the financing of MT research not only in U.S. but the worldwide.

Currently the state of machine translation is such that it involves some human intervention, as it requires a pre-editing and post-editing phase. In other words, the MT systems produce output, which must be revised or ‘post-edited’ by human translators if it is to reach the translation of publishable quality. Sometimes such revisions may be substantial, as MT system produces only a ‘draft’ translation. However, in fields with limited range of vocabulary and simple sentence structure, machine translations are delivering good results. For example, TAUM, a Canadian MT system, with restricted dictionary of around 20,000 words and expressions, translates weather reports without any human intervention. It is a classic example of an effective and appropriate MT system for a task of limited domain. Since 1977, the system has translated around 15 million words from English to French without any human intervention.

Earlier the MT systems were based on ‘direct’ translations via bilingual dictionaries, with very little analysis of syntactical structures. By 1980s, advances in computational linguistics, allowed much more sophisticated approaches, and a number of systems adopted ‘indirect’ approach (e.g. ‘Interlingua’ or ‘Transfer’) to the task of translation. In these systems, text of source language is analysed into abstract representation of ‘meaning’ involving successive programs for identifying word structure (morphology), sentence structure (syntax) and for resolving problems of ambiguity (semantics) including component programs to distinguish between homonyms (e.g. English words such as *plant* which can be botanical or industrial) and to recognise correct semantic relationship. In **Transfer approach**, there are three basic stages: analysis of the input text into abstract source representation, transfer to a target representation and generation into the output language. The transfer model is shown in Fig. 12.1. In this system three dictionaries are needed: i) A source language dictionary (SD), ii) A target language dictionary (TD), and iii) transfer dictionary i.e. bilingual dictionary (STD). In transfer approach, the transfer stage requires bilingual component for each language pair, that is, each SL-TL pair. Therefore, in multilingual environment, the number of transfer blocks required, would be equal to the number of languages a MT system covers. The level of transfer differs from system to system. In Fig. 12.1 the extent of complexity of the transfer, range from TRANSFER-2 (maximum) through TRANSFER-0 (minimum). METAL from Siemen Company from Germany is the commercial MT system adopting ‘transfer’ approach. The other systems adopting the transfer approach are research projects ‘Arian’ by MT Group GETA in Grenoble and ‘Eurotra’ funded by European Commission.

Interlingua Approach: In this method the source text is analysed into abstract representation, which is designed to be a kind of language independent ‘interlingua’ and can serve as an intermediary between large number of natural languages. The translation is in two basic stages: from source language to interlingua and from interlingua into the target language. The example of an experimental interlingua system is the program by Cordier & Mograbi which translates cooking recipes from French into Arabic. Fig 12.2 shows interlingua model of machine translation.

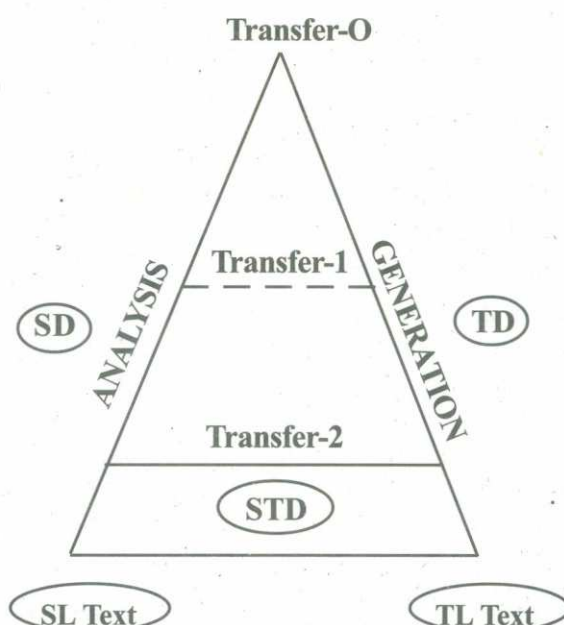


Fig.12.1: Variants of Transfer Model of Machine Translation

(Source: Tucker, Allen B (et. al.))

(SL-Source Language, TL-Target Language, SD-Source Language Dictionary, TD-Target Language Dictionary, STD-Source Target Dictionary (Bilingual Dictionary))

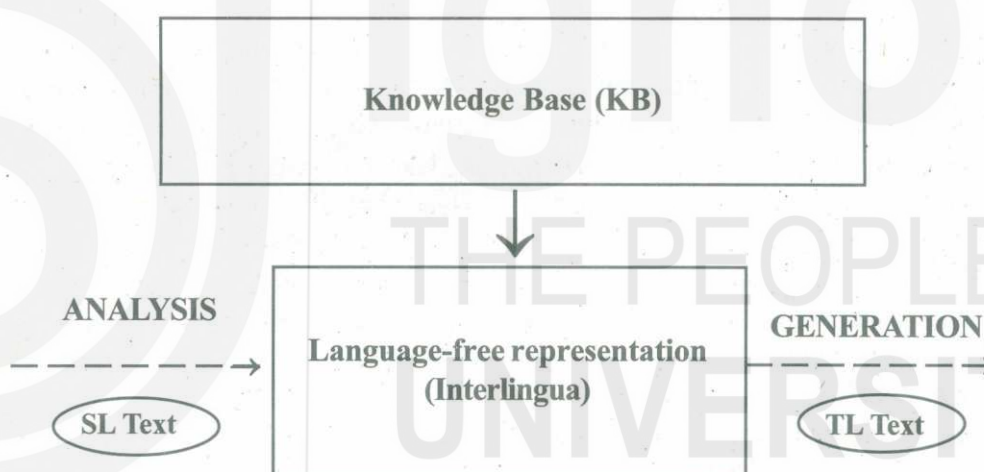


Fig.12.2: Interlingua Model of Machine Translation

(Source : Tucker, Allen B (et.al.))

MT Systems for Mainframe, Personal Computers and Internet

The most widely known MT systems for mainframe computers are SYSTRAN, METAL, LOGOS and Fujitsu (ATLAS) systems. The SYSTRAN system, originally designed for translation from Russian to English, is now available for 35 language pairs. LOGOS, originally marketed for German to English, is also available for other languages: English into French, German, Italian and Spanish, and German into French and Italian. The Fujitsu ATLAS is for English to Japanese and vice versa. METAL system is for German to English, English to German, German to Spanish, French to Dutch and Dutch to French.

MT systems for personal computers began to appear in the early 1980s. Wielder MicroCat system was the first successful system. Around same time most of the main Japanese computer companies produced systems for translation to and from English, such as the PIVOT system from NEC, the ASTRANSAC system from Toshiba,

HICATS from Hitachi, PENSEE from Oki and DUET from Sharp. At the end of 1980s most of the commercial systems on the market presently available appeared. Some of these MT systems for PC are PC-Translator System, Globalink, LogoVista, etc. SYSTRAN, ATLAS, METAL, LOGOS have also brought out PC-based versions. Systran Company offers wide range of PC products such as SYSTRAN Professional, SYSTRAN Personal, SYSTRAN Office Translator, and SYSTRAN WebTranslator. The SYSTRAN MT systems with large dictionary databases and large number of languages, have advantages over other PC based systems.

The demand for translations of electronic texts on the Internet, such as web pages, electronic mail and even electronic 'chat' lists, is developing rapidly. Many MT vendors like Systran, Logos, Globalink, Fujitsu, JICST and NEC have been providing network-based translation services for on-demand translation with or without human editing. Many new companies have also launched their products specifically for Internet. LANT in Belgium has launched its multilingual service for translation of electronic mail, web pages and attached files. MTSU in Singapore is providing large-scale translation over the Internet for many customers worldwide. Many Japanese companies have been providing MT software products for translating web pages. Even Internet services are adding translation facilities. For example AltaVista is offering translation facility, for translating French, German, and Spanish into and from English, on the Internet. Equally significant has been the use of MT for electronic mail and for 'chat rooms'. In 1994 the CompuServe service introduced automatic translation from to English and French, German or Spanish for messages on one of its forums. It became so popular that within next two years the facility was extended to two other on-line services. Now thousands of messages are being translated. CompuServe has introduced its own translation service on the Internet for longer documents either as unedited 'raw' MT or with optional human editing. CompuServe also offers MT as standard for all its e-mail. Many of the MT systems offer free translation facility on the web. Listed below are some of these sites. (<http://www.compuserve.com/>)

http://www.google.com/language_tools (uses SYSTRAN software)

<http://www.freetranslation.com/>

<http://www.systransoft.com/>

<http://www.systranet.com/> (SYSTRAN site)

<http://balefish.altavista.com/> (uses SYSTRAN software)

<http://www.babylon.com/>

Another area of MT research is the development of systems for spoken language translation e.g. in telephone conversation and in business negotiations. In Japan a joint government and industry company ATR, was established in 1986 near Osaka for research on speech translation. It is now one of the main centres for automatic speech translation. The aim is to develop a speaker-independent real-time telephone translation system for Japanese to English and vice versa, initially for hotel reservation and conference registration transactions. Other speech translation projects are JANUS system in Carnegie-Mellon University and Karlsruhe in Germany. The researchers are collaborating with ATR in a consortium (C-STAR), each developing speech recognition and synthesis modules for their own languages (English, German, Japanese).

Self Check Exercise

- 4) What is machine translation? Describe different types of approaches used for machine translation.

Note: i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

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Tools for Translators

It has been observed that professional translators spend considerable amount of their time consulting technical (monolingual, bilingual and multilingual) dictionaries, to find suitable technical terms while translating S&T documents. They have long been wanting to have sophisticated computer-based translation tools to speed up translation process. The development of translation tools became feasible, firstly with the availability of real time interactive computer environments in late 1960s, then with the appearance of word processing in the 1970s and of microcomputers in 1980s and, subsequently, with intra organisational networking and the development of large computer storage capacities. Since the early 1990s the translators could have these translation tools in the form of **translation workstations**. The translation workstations offer translators the opportunities of making their work more productive without taking away intellectual challenge of translation. Translation workstations combine access to dictionaries and terminological databanks, multilingual word processing, the management of glossaries and terminology resources, appropriate facilities for input and output of texts (e.g. OCR scanners, electronic transmission, high-class printing) and **translation memories**. **Translation Memory (TM)** is a software programme designed as an aid for human translators. A translation memory consists of a database of text segments in source language and their translation in one or more languages. These segments may be individual words or multiword phrases. Using TM a translator can translate save and reuse translated sentences and passages. When translator comes across similar or identical material, he can reuse the previously translated material. Even if there is not exact match, the version displayed may be used with minor changes. These systems are very suitable to help translators with technical documentations and documents containing specialised vocabularies. Among other advantages of TM are: i) Consistency in common definitions, phrases and terminology when a number of translators work on a single translation project; ii) Speeding up overall translation process; and iii) Making the translation process cost effective for long term translation.

There are 4 main vendors of translation workstations- i) Trados, ii) STARAG Company (Transit), iii) IBM (The Translation Manager), and iv) LANT in Belgium (The Eurolang Optimiser previously sold by SITE in France).

12.6.7 Translators Associations

Indian Scientific Translators Association (ISTA) was established in 1962. Dedicated to the cause of promotion of scientific translation in India, the association has been making

persistent efforts to bring S&T translation to the focus of public and government attention through talks, discussions, seminars, surveys, workshops, publications, etc. The main objectives of ISTA are to:

- promote facilities for scientific translation in India;
- endeavour to improve the status and service conditions of scientific translators;
- promote training facilities for scientific translation and take such measures as would lead to the maintenance of a high standard of scientific translation;
- convene conferences or conduct seminar on scientific translation;
- cooperate with national and international organisations with similar objectives;
- bring out publications which will tend to the realisation of the objectives of ISTA; and
- do all such activities as are incidental or conducive to the attainment of the objectives of ISTA.

Since 1972, the association has been publishing JISTA, Journal of Indian Scientific Translators Association. Published annually, JISTA covers articles and news items on theoretical and practical aspects of translation, training of translators, linguistic issues, scientific terminology problems, machine translation, updates on science and technology, etc. The association celebrates 'International Translation Day' on 30 September every year (since 1992). The focus has been on French translation, Korean translation, machine translation and machine translation tools, etc. The association has brought out 'Directory of S&T Translators in India' and maintains it on its website (<http://education.vsnl.com/ista/>).

In brief, in this section we have discussed the need for translation services, how to organise translation service in a documentation or information centre, and current scenario of translation facilities in India in the field of science and technology, humanities, and social sciences. A brief account of bibliographical control of translations at international level is provided. Described in detail, research in machine translation; major MT systems for mainframe, personal computers, and for Internet; and computer based tools for translators such as translation workstations, translation memories, etc. A brief account of Indian Scientific Translators Association is also provided. Website addresses of some of the websites offering free-to-use machine translation facility, on the web are listed.

12.7 SUMMARY

This Unit has dealt with four responsive information services viz. literature search service, technical enquiry service, document delivery service and translation service. It has been observed that advances in computers and telecommunication technologies are exerting great impact on these services. For instance, in literature searches, the availability of electronic databases offers speed, currency and wide range of search options. The compilation of comprehensive subject bibliography manually, was a time consuming and laborious process. Computer-based searching has made the process less time consuming. Moreover, it has offered other benefits such as in depth searching and free text searching. Similarly, the availability of electronic trade and business databases, company's websites, government's websites, etc. has greatly enhanced the technical enquiry service. The Electronic Document Delivery Systems (EDDS) involving libraries and commercial document suppliers are emerging. There is a global trend toward linking of electronic retrieval of bibliographic references with electronic full-text

retrieval of documents. New generation of e-journal service providers have emerged. These include publishers as well as aggregators. The problems associated with document delivery service are attracting worldwide attention and many international organisations are playing active role in solving these problems. Reduction in funding for information services has resulted in significant decline in translations made on ad hoc bases. This has led to the closure of International Translation Centre as well as its prestigious publication World Translation Index. Research in machine translation has resulted in a number of MT systems for mainframe, personal computers and for Internet. The availability of computer based translation tools such as computer based multilingual dictionaries, terminological databanks, multilingual word processing, and translation memories are greatly facilitating the translation process by professional translators.

12.8 ANSWERS TO SELF CHECK EXERCISES

- 1) Online searching is the process of interrogating a computer system to resolve a particular request for information. The search process is interactive and user can modify the search until desired results are obtained. Information professionals have identified four generations of online searching. First three generations were identified by Rowley (1999) and fourth one was added later by Chowdhury and Chowdhury (2001).

The first generation up to 1981, was characterised by dumb terminals, slow transmission speed, and mostly bibliographic databases.

The second generation, which continued through 1980s was characterised by PCs and workstations, medium transmission speeds, bibliographic and full-text databases and interfaces directed to end-users.

Third generation, which started at the beginning of 1990s, has been characterised by multimedia PCs, higher transmission speeds, bibliographic as well as full-text databases, and improved user interfaces, with help and tutorial facilities.

Fourth generation, which, started at the beginning of 1990s, with web access to online search services. User can go directly to the web address of an online service provider to log on to the service and retrieve the required information. Web based online search services such as Dialog web, Ovid online, OCLC first Search etc., provide fast and easy access to online databases with a number of search and retrieval facilities.

- 2) The technical enquiry is related to mechanical/ industrial arts and applied sciences and emanates from the specialists working in business and industrial sectors. The scope of general inquiries is very wide and may relate to humanities, social sciences or any other fundamental discipline and can originate from a layman to a specialist. On the other hand technical query always relates to an art (e.g. industrial art), science, profession and trade and originates from specialists.
- 3) A consortium is an agreement among similar institutions to finance a project, which would be too large for any one of them to bear the cost individually. Due to rising scholarly journals cost and declining library budgets, libraries are forced to cancel large number of journal titles. To make these journals available to their clients, libraries are entering into consortia purchasing of e-journals. Here a group of libraries enter into a multi site license agreement with publisher(s) of e-journals to make these journals accessible to their clients, for example the 'E-journal Consortium of CSIR'. Thirty-eight laboratories of CSIR are subscribing to 550 print journals of Elsevier Science publisher. By paying 9% additional cost of

subscribed print journals, all the scientists in 38 laboratories are able to access 1800 full text e-journals of Elsevier Science. The scientists can search, view, and download articles for R&D purposes. It has been observed that over 70% (about 1400) of these journals are being accessed by the scientists for their study and research.

- 4) Machine translation (MT) is the application of computers to the task of translating texts from one natural language to another. In MT system, the computer program analyses the text in one language- the 'source text' and then produces another equivalent text in another language – the 'target text' without human intervention. In machine translation, two approaches viz. 'direct' or 'indirect', are followed. In direct approach, bilingual dictionary is used with very little analysis of syntactical structures (of source and target languages). In indirect approach, the text of source language is analysed into abstract representation of 'meaning' of the text involving identification and coding of word structure (morphology), sentence structure (syntax), and semantic (relating to meaning) features of the source language. After analysing the source text, the conversion into target language is carried out either by 'transfer' approach or by 'interlingua' approach. In Transfer approach, there are three basic stages: analysis of the input text into abstract source representation, transfer to a target representation and generation into the output language. In this system three dictionaries are needed: i) A source language dictionary (SD), ii) A target language dictionary (TD), iii) and transfer dictionary i.e. bilingual dictionary (STD). In transfer approach, the transfer stage requires bilingual component for each language pair, that is, each SL-TL pair. Therefore, in multilingual environment, the number of transfer blocks required, would be equal to the number of languages a MT system covers.

Interlingual Approach: In this method the source text is analysed into abstract representation, which is designed to be a kind of language independent 'interlingua' and can serve as an intermediary between large number of natural languages. The translation is in two basic stages: from source language to interlingua and from interlingua into the target language.

12.9 KEYWORDS

- Consortium** : A consortium is an agreement among similar institutions to finance a project which would be bear long for any one of them to bear the cost individually.
- Homonym** : A word having same pronunciation and spelling as another word but different in meaning and origin.
- Research Library Group (RLG)** : RLG is an international not-for-profit membership organisation of libraries, museums, and archives working together to create solutions to the challenges of information access and management.
- Translation Memory (TM)** : It is a software program designed as an aid for human translators. A translation memory consists of a database of text segments in a source language and their translation in one or more target languages. The segments can be individual words or multiword phrases. Using TM a translator can translate, save and reuse translated sentences.

- Translation Workstations** : Computer based tools for professional translators consisting of dictionaries and terminological databases, multilingual word processing software, OCR scanners, laser printers and translation memories.
- Semantics** : Having to do with the meaning of the words and other linguistic forms and expression.
- Syntax** : a) Part of grammar dealing with the construction and functions of phrases, clauses and sentences.
b) The way in which the words and phrases of a sentence are arranged to show how they related to each other.

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UNIT 13 INFORMATION SERVICES – PART-II

Structure

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- 13.2 Application of Content Analysis in Information Services
 - 13.2.1 Information Storage and Retrieval
 - 13.2.2 Information Services and Products
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- 13.7 Internet as an Aid to Information Sources
- 13.8 Summary
- 13.9 Answers to Self Check Exercises
- 13.10 Keywords
- 13.11 References and Further Reading

13.0 OBJECTIVES

After reading this Unit, you will be able to:

- get a clear insight into the various types of information services, offered by libraries and information centers;

- comprehend the wider meaning and scope of information services;
- obtain the value of some of the analytical tools and techniques applicable in almost every area of professional work centered around users;
- get acquainted with the use of information sources to access primary literature in different disciplines available in multiple forms and formats;
- assimilate readily available sources of information to provide a variety of information services in library and information centres; and
- appreciate the role of Internet as an invaluable aid of information sources.

13.1 INTRODUCTION

The core area of activity in any library or information centre is to provide a variety of information services to different users or user groups. Reference and information services are meant for users to locate and retrieve information available in primary literature, scattered over numerous sources. You know that in offering information services, the distributed references are collected, analysed, condensed, repackaged and disseminated to facilitate their use. These services may be in the form of secondary and tertiary information products, which the end users may use appropriately, serving their respective interests or requirements.

There are a number information products and services available for users to meet their various needs. The range and depth of such services are closely associated with the levels of users who may be at the elementary, advanced, highly specialised or at the expert levels. Consequently the need for customisation of information services arises to relate the services for use at which the information services are to be offered. Thus, the information services naturally have to get organised to match the exact needs of users with the information required. The advent of modern information and communication technologies has made information generation, storage and dissemination more versatile by providing scope for a variety of new and innovative services. Modernisation of information services offers new avenues and opportunities for research and development to provide highly customised and personalised services.

In this Unit you will know about a few tools and techniques that are very useful to provide information services, such as, content analysis, customised organisation of information services, citation analysis-based products and varieties of aids to reach out to the sources of information including Internet. Most advanced information services are presently available in automated and networked environment. Future information centres and libraries will be better equipped with sophisticated Information and Communication Technologies (ICTs) that would enable customisation of information services more easier to cope up with changing needs.

13.2 APPLICATION OF CONTENT ANALYSIS IN INFORMATION SERVICES

You have already learnt about content analysis in the course MLII-102 of this Programme. In library and information services, content analysis is used for different purposes. The contents of primary documents are critically analysed and used to create secondary information sources of information, and to develop value-added information services and products.

You know that libraries and information centres handle information and knowledge, available in a variety of recorded forms and provide various simple and complex services

to different categories of users. Knowledge and information being the product of the human mind, servicing them entails a good insight and understanding of the techniques of knowledge organisation which involves a series of intellectual processes in which content analysis and classificatory principles are intrinsically intertwined. These processes not only analyse, but also synthesise ideas and units of knowledge and present them in a form required by potential users. Thus, content analysis is at the very bottom of almost every service activity of a library and information centre. In essence content analysis using the principles of classificatory techniques, in general, enhances the quality of storage and retrieval of information. The ability and skills in applying these intellectual process of classificatory analysis, permits an information scientist to offer a high quality service to persons in R&D contexts and knowledge management in business and industrial environment and such others.

In the context of library and information centre's functioning, the technique of content analysis may profitably be applied to the areas mentioned below:

- Information Storage and Retrieval
- Information Services and Products
- Information Centre Management

13.2.1 Information Storage and Retrieval

The basic function of a library or an information center is to provide access to its collections, physically located at different stacks, through surrogates (substitutes) such as catalogues, indexes, and other bibliographical tools. Irrespective of the nature of approach of a user, it should be possible for a user to get the required item with the help of these tools. The physical collections of the library are maintained in an organised display in the stack rooms, using a standard system of classification that would facilitate browsing. The main purpose of a library catalogue is to help users to identify their needed documents by author, title or subject or any other approach. Standard classification systems and standard subject headings lists used to facilitate subject approach to documents are available in a library. This has been an age-old and well-established practice in libraries or information centres.

With the proliferation of publications in multidisciplinary and interdisciplinary subjects, approach to contents of documents has been a major challenge. With the application of ICT, efforts towards new methods of retrieving documents have been continuously experimented and developed. In all these efforts, the basic principles of content analysis for storage and retrieval of documents are applied. These principles constitute a set of rules and procedures for intellectual analysis and synthesis to represent the contents of documents by providing appropriate keywords or descriptors. To represent contents of documents systematically and consistently, an international standard [ISO 5963-1985 (E)] has been brought out, which provides a methodological guide for knowing the aboutness of the contents of documents.

In the present electronic environment information is stored in a retrieval system in the form of 'messages' in physical records, bearing graphic markings (numbers, text drawings, etc.), which carry meaningful contents that a recipient can interpret. Such records in retrieval systems may be of several kinds; for example

- Quantitative and qualitative data about various interests;
- Texts (including illustrations) on every kind of subject;
- Drawings, graphs, charts, maps, and other graphic material;

- Descriptions of subjects e.g. of minerals, laboratory apparatus, industrial equipment; and
- Names and locations of people, institutions, manufacturers.

For Indexes and Concordances (an analytical index to ideas and thoughts of works of great authors such as Shakespeare or Tagore along with the places of locations of these ideas and thoughts), contents analysis techniques are used. Keywords could be automatically extracted from the text of a document for the purpose of indexing. However for concordances, when the works of an author go beyond a single document, automated extraction of keywords may require a more complex method and sophisticated procedure. For example, for all the plays of Shakespeare with all the editions, the work of content analysis would need highly sophisticated software for the preparation of a concordance.

Computer-based indexing systems, in general, are not using the techniques involved in the mental process of human beings for content analysis and representing them appropriately. Expert systems of information storage and retrieval, of course, do try to make use of the mental approach of human beings to simulate such possibilities. Automatic indexing has been largely using methods of relative frequencies of keywords in the text of a document.

Indexing Language

For effective retrieval of information, many information storage and retrieval systems use a standard terminology, usually, a list of standard subject headings, a classification system or information retrieval thesauri. For preparing such standard tools, the techniques of content analysis are employed in collecting appropriate terms from a number of source documents and organising them into homogenous groups. However, the purpose of such terminological control devices is to provide tools for information storage and retrieval systems and to retrieve relevant documents sought by a user.

The compilation of a subject index involves three main tasks:

- a) Determining the subject matter of documents, by analysis of their contents;
- b) Selecting the terms which together summarise the subject of the document; and
- c) Indicating relationships between concepts represented by these terms.

The effectiveness of an information storage and retrieval system depends upon well-constructed indexing terms and, thus, calls for human intellectual decisions, including those systems in which a computer is used to store and manipulate terms or to identify documents associated with terms or combinations of terms, assigned by an indexer.

An indexing language helps in the selection of terms and indicates the relationships between the concepts represented by these terms. An indexing language thus, helps the indexer in identifying the relevant terms to represent the subject of a document and at a later stage it also helps the searcher to select the relevant terms to retrieve documents on a particular subject. Thus, an indexing language is indispensable both at the time of storage and later, at the time of formulating search strategies and retrieval.

In a computer-based information retrieval system, the use of an indexing language becomes more critical as computers provide for multi-pronged searches using Boolean and other search techniques. After sufficient numbers of terms are collected, all terms are then reviewed by a group of specialists, consisting both of indexers and subject experts. These terms are then organised into hierarchical groups, indicating the broader and narrower terms and establishing the associative relationships. These constitute a few preliminary steps in the construction of a standard information thesaurus or a

classification schedule. Large parts of it use content analysis techniques. For further details on this aspect, Units 1-3 of MLII-102 course may be referred.

13.2.2 Information Services and Products

For generating different types of information products and services, the techniques of content analysis can be profitably used. In preparing abstracts, digests, synopsis and such other condensation services, the thought contents of documents are analysed into central and supporting ideas, and statements are drafted highlighting the basic ideas of documents. The purpose of such condensation is to provide a reliable subject surrogate of documents, which would be sufficient for the user to decide whether or not to seek the full-text of the original document. In providing access to abstracts also, indexes are generated where content analysis is important.

Consolidation services are offered by providing a consolidated, descriptive and critical account of a topic on which documents have appeared over a period of time. Here, an assessment is made of the contributions and a complete review or state-of-the-art report is prepared, giving a user a total view of the trends of literature in a given topic.

In repackaging services, the literature on a particular topic is rehashed and rewritten to suit the requirement of a user. The user may be a non-technical person to whom a general understanding of a technical problem, process or a product may have to be explained. Similarly, a popular presentation of a scientific or technical literature may be necessary for a generalist reader who should be able to have an intelligent understanding of technical matters. In all these types of services, content analysis techniques extend much beyond the normal requirement for indexing, i.e., identification of concepts in a document and choosing appropriate keywords to provide access to them. In Selective Dissemination of Information (SDI) and similar other services, users' needs are analysed and user interest profiles are prepared. Here, what is being analysed is not any written or recorded document but the way a user decides to collect information. In the provision of reference and information search services direct interaction with users is helpful wherein content analysis takes place indirectly.

In online information services, the need for searching database with a clear understanding of the information needs of a user is absolutely essential to avoid false retrieval or over information and to avoid unnecessary expenditure. The search strategy has to be formulated with great care if an intermediary is doing the search. User-friendly systems are available today. A careful search formulation by analysis of queries is also absolutely essential here.

13.2.3 Information Centre Management

Analysis of different records in library and information centres provide very valuable information to management. Circulation records give vital clues to the use of materials, users' preferences, collection building and such others. Similarly, analysis of the type of questions often asked and the sources consulted to provide right answers and the level of satisfaction furnish valuable information. It may not be that the method of content analysis as is employed in indexing or abstracting are used here but these may provide sufficient insight to the management for relooking at the services and products and their usage may be enhanced.

Self Check Exercises

- 1) Describe how content analysis constitutes an intellectual foundation for library and information services.
- 2) Mention the areas of library and information services, wherein content analysis can be profitably applied.

- Note:** i) Write your answers in the space given below.
ii) Check your answers with the answers given at the end of the Unit.

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13.3 CUSTOMISED ORGANISATION OF INFORMATION SERVICES

Information is available in a variety of documentary forms such as journal articles, research and technical reports, conference papers, standards, patents, dissertations, survey data and now on World Wide Web (WWW). According to the nature of contents carried by these types of documents, these are categorised as primary, secondary and tertiary sources. The primary sources carry original, first hand information. But the volume, variety and complexity of these types of primary sources have grown to such proportion that these place severe constraints in their use, to access references even from a small number of them. Almost simultaneously, the needs of users have also grown in variety and complexity. Naturally all these constraints clearly indicate that a single tool would not be able to meet all information needs of users. As a consequence, information providers have designed and developed another type information product, the secondary sources. The various indexing and abstracting services and other bibliographic tools are grouped as secondary sources. Another category of information sources, generally referred to as tertiary sources, is the third type. These sources carry directory type information, such as names of institutions with their activities and services, names of persons with their personal information in any special field(s), and such others. Other than these, there are 'reference sources' which may overlap the secondary and tertiary sources. These types of sources provide answers to specific questions. All these have been designed and developed to serve as a control mechanism of primary sources of information, not necessarily as a solution to sort out the information problems of users. However these tools keep constantly redesigned to cope up with the advances in every field.

13.3.1 Meaning and Need

Customised organisation means the tailoring, organising and presenting the original information or sources of information according to the needs of the users in a way or form that will facilitate identification, location, access and use of information. A comparison of this idea with the commodities in day-to-day life will make this point clear. Just as a commodity in the market is produced, packaged and made available, keeping in view the requirement and preference of consumers, the information sources also need to be compiled and reorganised according to the needs of the user community. Such sources are developed through customisation of the original information sources. The organisation of sources without taking into account the user requirements may not be used at all and, thus, may lead to wastage of effort. This emphasises the importance of customised organisation of information sources and services.

So, for the customised organisation of information services, it is necessary to know the users' information needs. In the next section we will discuss the generalised information needs of the users.

Self Check Exercise

3) Mention the various categories of information sources and their characteristics.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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13.3.2 Users and their Information Needs

It may be stated that organisation of information presupposes the existence of the need to know the users and their information use patterns. Users of information may be of different categories, such as Research and Development (R&D) workers, technicians, planners, managers, decision makers, educators, students and common men at various societal levels and status, etc. A large number of studies have been conducted to understand the pattern of information need of the users. Such studies reveal that the information need may vary from person to person, and a particular person may also need different information at different points of time. In general, the 'Information Gathering Habit' surveys have identified four types of information needs of the users. These may be categorised as:

- a) Current Information Needs
- b) Exhaustive Information Needs
- c) Everyday Information Needs
- d) Catching-up Information Needs

The information needs of the planners and decision makers may be different. But, such needs are critical in all cases. It is necessary to know the characteristics of these needs to have an insight for the nature of customisation required. In the following subsection we will study the characteristics of such needs and the corresponding services.

13.3.3 Customised Organisation of Information Services in Relation to Users Needs

The users look for the information sources according to their nature of information requirements. Let us now understand how the information services can be customised according to the different categories of users needs.

Current Information Needs

The users need information so that they would keep themselves abreast with the latest developments in a particular field and related areas. They require information fairly fast and the need may not be for specific and pinpointed information. He/She wants to have birds-eye-view of what is happening in his/her area of interest and related areas. Speed and timeliness of getting the information and ease of use are the main characteristics. This need is felt more on those areas where the rate of development of the subject is very high. A knowledge of the current activities in the field helps him/her in various ways, such as, choice of new area of activity, product and process; avoidance of

duplication of work utilising the methods and techniques used by others; being conversant with latest developments, etc. At times this knowledge may lead him/her to change the methods and techniques of work. Sometimes it is compared with newspaper approach.

Related Information Services

The services and products required for current information needs are of a very temporary nature and not of permanent value. The current information need, thus, requires speed and timeliness of information. Much time cannot be spent for its provision. The latest information should be brought to the notice of the users as early as possible soon after their reporting. The speed factor necessitates that much time cannot be spent on the collection, designing and presentation of information. Information services designed and developed to meet this category of need are in the form of various types of 'Current Awareness Services' such as Title Announcement Bulletins, SDI Bulletins and so on. In the methodology of organisation of this types of sources, title of the documents figures prominently. As the name suggests basic input to these type of customised services are titles. Titles may be arranged by broad subject groupings or in classified sequence. The advantage of presentation under broad groupings of titles is that it does not take much time in deciding the broad subject heading and in most cases those subject headings coincide with the broad subject interests of the users. In cases where a title belongs to more than one subject, cross-reference may be provided. Most of the international lists follow this pattern of arrangement. In the production of title list for specific projects or similar other activities, the arrangement by title of references may need appropriate modifications.

Classified arrangement always presupposes the use of a classification scheme. Titles are extensively classified at depth coextensively reflecting the thought contents of the title. In this method a user can find items on information on specific topics and also can scan broader areas very easily. Scattering problem of the titles is also solved. One of the problems of this method is that it takes longer time to classify a title which hinders the quick production of the service and the users have to be conversant with the classification scheme. Thus, it may hamper the easy usability. All the above methods of customisation are based on the production method by recomposition.

To overcome the problem of time and ease of access, another method of title announcement mechanism – 'contents by journal' has been evolved. Here, the titles of journals are taken as a unit in contrast to other methods where individual articles are units. In this method, the titles of the journals are arranged under broad subject groups. The advantage of this mechanism is that content pages of journals are duplicated and these can be arranged according to requirement. In some cases additional features like authors directory are provided. These sources are presented in such a manner that users are able to consult them very easily and quickly. Some of these sources are available online.

Many contents by journal information services bring out products based on the contents pages of the journals, e.g., *Current Contents*. The *Current Contents*, published weekly, by the Institute for Scientific Information (ISI®), Philadelphia is the most popular service to cater to current information needs of the scholars. It covers tables of contents of some internationally renowned peer-reviewed journals in different disciplines. *Current Contents* is brought out in seven separate sections:

- • Current Contents – Agriculture, Bioiogy and Environmental Sciences
- Current Contents – Arts and Humanities

- Current Contents – Clinical Medicines
- Current Contents – Engineering, Computing and Technology
- Current Contents – Life Sciences
- Current Contents – Physical, Chemical and Earth Sciences
- Current Contents – Social and Behavioral Sciences

The *Current Contents* is available in print as well as in electronic formats, like, Floppy Disk, CD-ROM and Web-based.

Web-accessible *Current Contents Connect (CCC)* includes tables of contents and bibliographic records from about 7,600 journals and 2,000 books, web-documents, e-journals and preprints. CCC is an attempt to agglomerate all sections of *Current Contents*. CCC also provides *eFirst* service that indexes 'pre-published' journal articles made available by publishers before inclusion in complete journal issues. It also provides links to full-text articles available in Internet. CCC is now a part of *ISI Web of Knowledge* – an Internet gateway and interface of scholarly communication across the globe.

The *Current Contents Proceedings*, published monthly by the ISI in electronic diskettes, is another popular source of current information. It covers tables of contents of proceedings of most prestigious conferences, seminars, congresses and other events in different disciplines of the sciences, social sciences and humanities. The *Current Contents Proceedings* is brought out in two separate sections:

- Current Contents Proceedings – Biomedical, Biological and Agricultural Sciences
- Current Contents Proceedings – Engineering and Physical Sciences

The *ISI Proceedings* is one of the core contents of *ISI Web of Knowledge*.

All these current awareness information products are available commercially and many libraries and information centres subscribe to these customised information products to serve their users. Some information centres also attempt to bring similar, discipline-specific information products which may have limited circulation. An example of current awareness service at national level is *Current Journal Contents: A Monthly Current Information Services* published by the Institute of Defence Studies and Analysis (IDSA), New Delhi (since 2002) for researchers and strategic decision makers. It gives the content pages of selected journals received in the IDSA Library. The issues of *Current Journal Contents* are made available to IDSA researchers through Institute's Intranet and printed copies are mailed to external readers. IDSA also provides photocopies of articles listed in the *Current Journal Content* as backup service.

You have already studied the components of Selective Dissemination of Information (SDI) and its methodology of production in BLIS Programme. The SDI service is the best example of customised information service. Here, the documents' profiles are matched with users' profiles, so that a user can get information of current literature on his/her area of interests on personal basis. SDI service is an example of personalised current awareness service. This service can also be provided on project basis or based on user's group information profile. It may be possible to provide computer-based alert service for information of current literature directly to the users through e-mail, or other communication media. *ISI Web of Knowledge* provides facilities to get personalised information at regular intervals to its registered users. This types of personalised sources have to be planned carefully, keeping in view speed and ease of use of the product.

In addition to the above—Title Announcement and SDI, there can be many more varieties of CAS as may be required such as Newspaper Clippings, Research in Progress Bulletin and similar others.

Exhaustive Information Needs

The exhaustive information need occurs at a time, when a user wants to obtain information on a subject, as exhaustively as possible. The availability of all the relevant information sources helps him/her avoidance of duplication of effort, choice of new areas of work, etc. This kind of need arises particularly when a person is contemplating to take up new areas of research. The service to be provided need to be customised in such a way that the coverage should be as exhaustive as possible and each and every important aspect of the sources are to be identified and properly indexed. Thus, exhaustive coverage of the information sources aids literature searches and furnishes a total picture relating to the availability of information in a that particular field of activity. The characteristics of such services are exhaustive in coverage and provision of access points through varieties of indexes to help the users to decide about the necessity of consulting original sources.

Related Information Services

The exhaustive information need requires that these sources should provide a complete range of information on a subject irrespective of the type, language, availability, etc. of the sources. In comparison to previous type of sources, these sources should provide not only the titles but also information in the form of indexes and/or abstracts. Bibliographies, various indexing and abstracting services are examples of this type. In the case of bibliographies and indexing services, sometimes, abstracts are also provided to help users to select proper information sources. These sources are available at local, national, regional and international levels. Such services may be according to subject content viz., Chemical Abstracts, Biological Abstracts, Index Medicus, etc. and nature of information content, viz., Dissertation Abstracts, Conference Papers Index, etc. At a local level, these sources can be generated on the basis of subject requirement of the organisation and its users. Most of the services at international level are now available online with the facilities of search according to various requirements.

The Chemical Abstracts, Biological Abstracts and similar other products provide a number of indexes to facilitate easy consultation of abstracts and bibliographic information. The electronic versions of these products provide a number of access points, similar to indexes of printed products.

Everyday Information Needs

This need recognises the fact that there are certain types of information which are required by users in their day-to-day activities. The characteristics of this information need is that the requirement is for a very specific piece of information for which a quick answer is expected and such answers are provided by consulting specific types of reference tools. For example, in the case of doing some experiment at a laboratory, a chemist may look for information on a specific gravity of some substances. At this point the information is required urgently and the service should be able to provide this information. In comparison, the earlier two categories of needs and related information services point to the sources of information.

Related Information Services

To meet the everyday information needs of users, the availability of actual information is of paramount importance rather than pointing to the sources of information. The

sources that satisfy this type of user's need are generally in the form of hand books, data books, data banks, etc. which are designed to provide quick, accurate and specific information. Obviously, these sources require collection, analysis, and evaluation of information from various primary sources and presentation in a form that facilitates quick retrieval of information. Reference sources like directories; dictionaries, yearbooks, etc. also prove to be a handy source to provide the needed information.

There is a proliferation of Internet-based information services to cater to this type of information needs which provide factual information from various databases, data books, hand books, directories, and from some real time systems (for weather information, stock prices, etc.).

Catching-up Information Needs

At times, some users require a complete but a short picture of the development of a particular field of activity. This need arises when a particular user wants to switch over to a new area of research in which he/she is not conversant or just wants to be conversant with the new area. Such users need a bird's-eye view of the subject. The characteristic of this type of need is that the users had not been interested in the area of work earlier. The information is to be made available in a short and simple form which will provide the complete picture of the subject that could be comprehended easily.

Related Information Services

The catching-up information need is satisfied through the services, by providing original information in a form which is easily understandable by the users. These are basically in the form of a write up. The requirement here is for a brief but a complete picture of a particular field rather than specific piece of information. So, the information sources in this case should be collected from various primary sources, sifted, analysed, and put in a proper perspective. The perspective is very important for such products, as users are not experts in the field and may not be able to realise the proper implication of the content. Information analysis, consolidation and repackaging are the methods followed in generating such services. Various kinds of review publications, state-of-the-art reports, advances, etc. are examples of this type of sources. Availability of more and more publications of this type in different subject areas points out to the increasing demand for this type of sources by the users.

Other Types of Needs and Related Information Services

The user's information need and related customisation of information services discussed above are generalisations of this topic. The need may be much more specific and varied for which specific information sources or services may be designed according to requirements. For example, the information requirements of decision-makers may be in the form of consolidated data, which may help, in decision-making process. In such circumstances, the information sources need to be customised in the form of 'compiled data' from various sources. Similar to these, there may be various ways and forms in which the information may be required, such as officials at the top level who may need information on a topic as a 'brief' or in the form of a digest. Accessibility to such products is a source related factor. The factors that would influence the use of an information source include its appropriateness to a particular need, its currency and cost. Many would like the sources to be more evaluative. The sources that provide authoritative review and synthesis are considered very valuable.

Self Check Exercises

- 4) Mention different kinds of users information needs and their characteristics.
- 5) Explain the need and ways of customised organisation of information services.
- 6) How many sections does *Current Contents* have?

Note: i) Write your answers in the space given below.

ii) Check your answers with the answers given at the end of the Unit.

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13.4 CITATION ANALYSIS-BASED SERVICES AND PRODUCTS

A completely different type of information products have been developed based on citations which in a sense is a non-conventional one. Dr. Eugene Garfield's foresight made it possible to bring out citation indexes and its different by-products.

Citation

Citations are list of references which an author mentions in his/her writing indicating that the references have been used by him/her for some purpose such as, support for a particular viewpoint, or as an authority for a statement of fact, or an acknowledgement of an earlier work on which the present work is based, or an indication of a related work and so on. Citations generally occur at the end of an article, usually under such heading as 'References'. Sometimes these may occur also in the form of footnotes or in the body of the text. The words citation and reference are frequently used interchangeably in this context. The reference to the paper where the citation is occurring is known as citing and the reference, which is given by the citing paper, is known as cited. Based on the citing and cited references, Dr. Eugene Garfield from the Institute for Scientific Information, (ISI) Philadelphia, USA produced an index, which is different from conventional indexes. This index is based on references rather than keywords.

Let us take an example to explain the concept. In the example mentioned below, some references have been listed. Each one of the references representing a document (i.e., cited document) is a citation.

13.4.1 Citation Analysis — Meaning and Purpose

Citation Analysis

Studies based on citations are being generally termed as citation analysis. Sometimes they are referred to as cito-analytical studies. The services and products, developed by analysis of citations are referred to as cito-analytical products. Though citation -based studies have been going on in the world since long, such studies, however, did not receive the necessary attention till the advent of citation indexes. The advent of *Science Citation Index* in 1963, followed by *Social Science Citation Index* in 1973, and the *Arts and Humanities Citation Index* in 1978, considerably widened the vistas of citation-based studies and brought forth a variety of cito-analytical products.

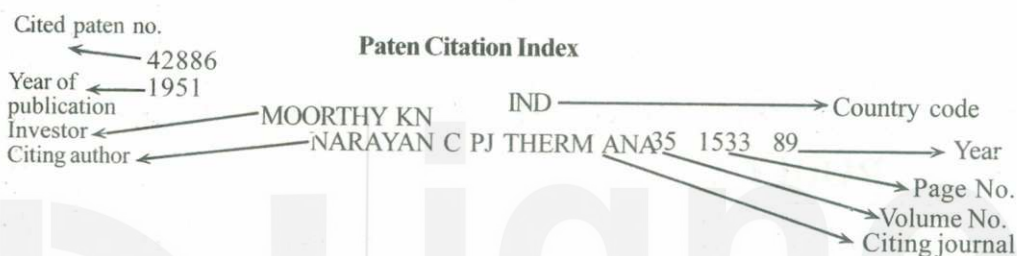
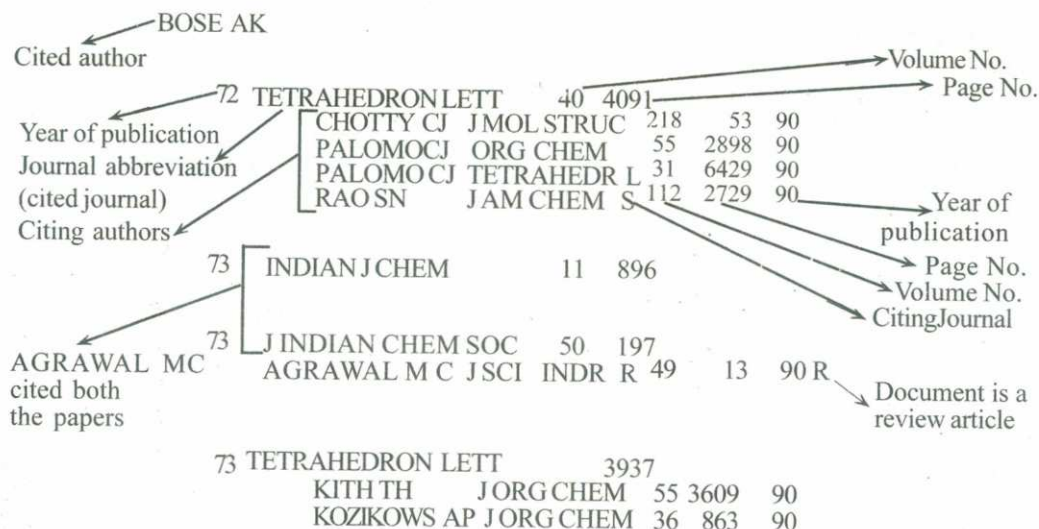


Fig. 13.1: Sample Display of Science Citation Index showing Relation between Source Document (Citing) and Citation (Cited) References

Purpose of Citation Analysis

Citation analysis has become a powerful tool to evaluate objectively a research periodical; determine the use of documents in a library; find out the active life of literature and also the important periodicals in various fields of knowledge. These help us to weed out the unused or least-used documents and guide us to procure the important ones, and thereby develop a balanced collection. The systematic and logical analysis of citations depicts the impact a scientist or an institution has made on others identifies the workers or teams active in a field, locates the significant contributions, and so on. The mapping of knowledge is another important application of citation analysis, where aspects like knowledge explosion, knowledge expansion, growth and obsolescence of subjects can be evaluated and explained.

Self Check Exercise

7) What is citation analysis?

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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13.4.2 Citation Indexes

The citation index is an alphabetical list of citations drawn from the references and footnotes of source items arranged under the first author, and each citation being the citing document with brief bibliographical description. Citation indexing is a process of automatic indexing, where the source items along with the cited references are processed. Citation indexes are the base of cito-analytical products.

Dr. Eugene Garfield was a pioneer in the field of citation indexing. He was involved in this area since early 1960s in two pilot projects, namely, index of patents' citations of 5000 chemical patents held by two pharmaceutical companies and US National Institutes of Health sponsored project Genetic Citation Index to the published literature on genetics in early 1960s.

Dr. Garfield started the Institute for Scientific Information (ISI) at Philadelphia, USA in 1958. In 1963, multidisciplinary Science Citation Index (SCI) first published covering 562 journals and 2 million citations in that year. In 1973, multidisciplinary Social Science Citation (SSCI) Index was launched covering major social science disciplines. In 1978, Arts and Humanities Citation Index (A&HCI) was brought out covering major disciplines in arts and humanities. All these citation indexes are available in CD-ROMs since early 1980s.

In 1988, the JPT Holdings acquired the ISI and later in 1992, Thomson Business Information, a subsidiary of Thomson Corporation acquired the ISI. These acquisitions made ISI more customer focused. In 1997, the ISI launched *ISI Web of Science*, a single web-based interface to access SCI, SSCI and A&HCI databases, with more access points than CD-ROM or printed products. The ISI Web of Science covers more number of journals than the printed or CD-ROM versions. It also provides search facilities of some back volumes of databases and some advanced features.

In 2001 *ISI Web of Knowledge* was launched which is a single, sophisticated platform that integrates various print and electronic resources like, journal literature, patents, proceedings, research monographs, chemical compounds and genetic sequencing.

Science Citation Index (SCI)

According to 2005 estimate, SCI provides access to about 3,700 leading scientific and technical journals of the world in 200 disciplines. Apart from journals, some books are also covered. It is available in various physical formats and media. The printed version is published six times a year. Cumulative editions carrying contents of previous issues are available in annual, five yearly and decennial volumes since 1965. CD-ROM version is published four times a year since 1988. The fourth issue is an annual cumulation. Back volumes are available till 1980. The SCI print version comprises several parts like, Citation Index, Source Index, Permuted Subject Index and Corporate Index. Citation Index provides index to cited references. Source Index provides index to citing papers and is arranged by the authors' names. Permuted Subject Index is a type of keyword index, where keywords are drawn from the titles of the citing documents only. Corporate Index provides index to places and organisations of the citing authors, where organisations are nested below the place names. *ISI Web of Science*, an Internet version of citation indexes, provides access to *Science Citation Index Expanded* covering about 5,800 leading S&T journals including some e-journals and other documents. The SCI database is available from 1990 to present. You will come to know more about these indexes in section 13.6.2 of this Unit. Electronic versions of SCI have a number of access points and searchers can save the retrieved records as well as the search sessions.

Social Science Citation Index (SSCI)

It provides access to about 1,700 leading social and behavioural sciences journals of the world in various disciplines as well as selected relevant items from over 3,700 leading S&T journals. It also covers some monographs. Indexes are on the pattern of SCI. It is available in various physical formats and media. Printed form is published six times a year, with annual and multi-year cumulation. CD-ROM version publishes four times a year started from 1989. The fourth issue is an annual cumulation. Back volumes are available till 1981. *ISI Web of Science* also provides access to SSCI through Internet. The CD-ROM and online versions have a number of access points and searchers can save the retrieved records as well as the search sessions.

Arts and Humanities Citation Index (A&HCI)

It provides access to over 1,150 leading arts and humanities journals and includes individually selected items from about 7000 S&T and social sciences journals in a broad range of several disciplines. Print version is published six times a year and CD-ROM three times a year. The first issue of CD-ROM was produced in 1992. Back volumes are available since 1980. The *ISI Web of Science* provides access to A&HCI through Internet. The indexes of print version are on the pattern of SCI. The electronic versions of A&HCI have a number of access points and searchers can save the retrieved records as well as the search sessions.

Self Check Exercises

- 8) Highlight chronology of citation indexes.
- 9) What are the various parts of Science Citation Index?

Note: i) Write your answers in the space given below.

- ii) Check your answers with the answers given at the end of the Unit.

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13.4.3 Products Based on Citation Indexes

For varieties of purposes various customised products can be developed based on citation indexes and citation analysis. ISI has developed a number of such products, namely, *Journal Citation Reports*, *Essential Science Indicators* and *HighlyCited.com*, based on which further services and products can be developed. *Highly Cited.com* provides information on most influential papers to the research community. *Essential Science Indicators* provides a number of science indicators useful for policy making decisions.

Journal Citation Reports

The *Journal Citation Reports (JCR)* provides ranked lists of journals by total citations, impact factor, immediacy index, cited half-life and citing half-life from the references of the current year issues of SCI and SSCI source journals. It also provides lists of SCI journals by category, ranked by impact factor. The Journal Half-Life Package section

comprises cumulative chronological distribution of citations from citing to cited journals, and journals ranked by half-life. Citing and cited journal listings along with the distribution of citations in various journals over various years are also given. The *JCR* critically evaluates and ranks the leading journals of the world, published annually since 1975. Presently, the *Journal Citation Reports* is available in electronic formats only. It is a unique cito-analytical product, and functioning as a mine of information for all important S&T and social sciences journals of the world. It publishes science edition and social science edition in CD-ROM and print version. The *Journal Citation Reports on the Web* (JCR Web) is web-accessible analytical tool and can be available through *ISI Web of Knowledge*. JCR Web provides the ranked list of 7,500 world's most leading journals every year. A sample display of journal rankings is shown in Table 13.1.

Librarians, information analysts, publishers, editors, authors, research scholars and students use JCR for different purposes. It helps publishers and editors to formulate editorial and distribution policies. For scholars and researchers, it helps them to decide where to publish, and if already published, what is the present status of the journal in the scholarly world. For policy makers, it provides science and social science indicators so that they can focus on areas of research.

**Table 13.1: Journal Rankings sorted by Impact Factor, taken from JCR on CD-ROM – 2003
Science Edition**

Rank	Journal Abbreviation	Impact Factor	Immediacy Index	Cited Half-Life	2003 Articles	2003 Total Citation
1	Annu Rev Immunol	52.280	9.600	5.6	25	13797
2	Annu Rev Biochem	37.647	4.875	7.7	24	16322
3	Physiol Rev	36.831	3.727	6.6	33	13475
4	Nat Rev Mol Cell Bio	35.041	4.831	2.3	71	6588
5	New Engl J Med	34.833	11.719	7.1	366	152715
6	Nat Rev Cancer	33.954	4.821	1.6	78	3338
7	CA – Cancer J Clin	33.056	21.615	3.5	13	3342
8	Nature	30.979	6.679	7.0	859	343528
9	Nat Med	30.550	6.749	4.4	167	35913
10	Annu Rev Neurosci	30.167	2.000	6.5	23	7925

Use of Citation Indexes

Based on the citation indexes a number of services and products can be generated. For example, the citation index can be used for literature search service and compilation of bibliography on a specific subject. The methodology is based on cited and citing references. If you are not aware of any reference, you may start from Permuterm Subject Index. By identifying a reference you may search Citation Index part from where you may get a further number of references which may serve as a starting point for further search. Citation Indexes can also be used for generating review literature. The mapping of knowledge and subjects clustering are other important applications of citation indexes and their by-products. The network of subjects can be studied which may describe the nature of inter-disciplinary studies of research.

Nowadays, in many cases, the research scholars and decision makers are looking for help from libraries and information centres for different types of services other than the conventional information services and products. Those are in the form of identifying the core journals or core papers, which have made impact on the frontiers of knowledge.

Similarly the services of libraries and information centres are sought for in assisting them to assess the contributions of Indian research in the global scenario. The citation indexes and its by-products are essential tools for measurement and evaluation of the performance and contribution of a country, a region, research institutions, faculty members and researchers in respect to their scholarly contribution. For example, NISCAIR brings out an annual appraisal of CSIR-research institutions, called *CSIR Research Output*, based on Science Citation Index.

13.5 ICT AND CUSTOMISED ORGANISATION OF INFORMATION SERVICES

The face of library and information services and information seeking behaviour of the users have radically changed due to development and application of Information Communication Technologies (ICT) in information handling. The libraries and information centres are now equipped with highly sophisticated and advanced information management tools that extensively use modern ICT tools and techniques. The developments in ICT have made possible the customisation of sources according to requirements and provide varieties of information services in various forms which were hitherto not possible.

One of the factors that have great bearing on the use of information is the form in which the information is available now and presented to the user. Ease of use is important factor. Most of the users want a product in a form that will allow them to judge relevance and value of information as easily as possible. For example, for the illiterate village artisans it will be worthwhile to present the information using multimedia. This is also another way of customisation.

There are a number of customised information services available on Internet that sometimes supplement and at times replace the existing printed information sources. Nowadays, many information sources are available as either Internet-based products or CD-ROM products. Internet resources are more interactive, up-to-date and exhaustive (database of a number of years) than the CD-ROM products. One could find appropriate Internet resources to cater to any type of information needs. In section 13.7 of this Unit you will find further discussion on Internet as an aid to information sources.

Table 13.2: Internet-based Services Related to Various Information Needs

Services Related to Type of Information Needs	Example of Internet Resources	Target Group
Services related to current information needs	Current Contents Connect J-Gate	Researchers Researchers
Services related to exhaustive information needs	ISI Web of Science Compendex	Researchers Researchers and Technologists
Services related to everyday information needs	Online Telephone Directories of BSNL ITC Ltd's e Choupal Internet Public Library	Common Men Farmers Common Men
Services related to catching-up information needs	Online Encyclopaedia Britannica Access Science (McGraw-Hill Encyclopaedia of Science & Technology Online) Online Review Journal	Common Men Researchers and Subject Experts Researchers

The Table 13.2 shows that a number of customised information services can be generated using modern ICT tools and those can be made available through Internet, which has been most powerful media of communication in the twenty first century. Let us study a few cases of customisation of information services that use modern ICT tools and techniques extensively. These cases may give an insight to the library and information professionals in generation of dynamic futuristic information products that suit the present information needs of individuals as well as the organisations.

ISI Web of Science

The *ISI Web of Science* is a web-based interface to access exhaustive bibliographic and citation databases. *ISI Web of Science* is an information product of the Institute for Scientific Information (ISI), a subsidiary of Thomson Scientific, launched in 1997. It consists of five databases, viz. SCI, SSCI, A&HCI, *Index Chemicus* and *Current Chemical Reactions*, containing information gathered from thousands of scholarly journals in all areas of research. It provides powerful search facilities to authoritative contents of citation indexes. Using some combinations, search can be made more focussed and pinpointed. It has capability to search retrospective citation and source databases from a range of years. It offers various search options, and searcher has to select a time span and one or more databases. The search options available in the *Web of Science* are:

- Quick Search [Search for topic terms using Boolean operators (AND, OR, NOT, SAME) and wildcards (* ? \$)]
- General Search [Search for records by topic, author name, source title, and author address]
- Cited Reference Search [Search for articles that cite other works]
- Structure Search [Search for chemical compounds and reactions]
- Advanced Search [For experienced users who want to develop complex search strategies using field tags, Boolean expressions, and set combinations]
- Open Saved Search [Search for records by opening a previously saved search history file].

Some of the notable features of *ISI Web of Science* are:

- It provides access to *Science Citation Index Expanded* (year 1900 to present), *Social Science Citation Index* (year 1956 to present), *Arts and Humanities Citation Index* (year 1975 to present), *Index Chemicus* (year 1993 to present) and *Current Chemical Reactions* (year 1986 to present).
- It can navigate backward in time using cited references to uncover the research that influenced an author's work.
- It can navigate forward in time to discover the impact of a paper or other published item has on current research.
- It provides link to full-text of primary literature.
- Here, users can access groundbreaking scientific journal articles published between 1900 and 1944, through the *Century of Science Initiative*.
- Here, users can export or download records from the databases, and save the search sessions.

Self Check Exercise

10) What are the search options of *ISI Web of Science*?

- Note:** i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

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ISI Web of Knowledge

The *ISI Web of Knowledge* is the integrated, Internet-based platform, which provides a single convenient point of access. *ISI Web of Knowledge* is an information product of Institute for Scientific Information (ISI) in 2001. It helps all levels of scholars, researchers and information professionals to make natural language searches across multiple content sources. The *Web of Knowledge* provides integrated access to a number of resources, which can be grouped into Core Content, Analytical Content, Hosted Content, External Content and Information Management Tools. Core contents are multidisciplinary content from international journals, conference proceedings, patents, chemical reactions and compounds, and web documents. Analytical contents are citation based performance data that can be used to analyse and evaluate scientific and scholarly influence. Hosted contents are authoritative, subject specific resources from other information providers. External contents are high quality, freely available electronic resources not hosted on *Web of Knowledge* but important to researchers. Information management tools are particularly important to information professionals for data handling and customisation. The contents available in *ISI Web of Knowledge*, are listed below:

➤ *Core Contents*

- *ISI Web of Science* [a tool for accessing journal literature and citation indexes]
- *Current Contents Connect* [a tool for accessing current scholarly literature]
- *ISI Proceedings* [a tool for accessing conference proceedings literature]
- *Derwent Innovation Index* [a tool for accessing patent literature]

➤ *Analytical Contents*

- *Journal Citation Reports on the Web* [an evaluative tool for assessing scholarly journals]
- *Essential Science Indicators* [a tool for performance measurement and tracking trends in S&T and social sciences]
- *HighlyCited.com* [provides information on the world's most highly cited researchers and their achievements]

➤ *Hosted Contents*

- *BIOSIS Preview* [provides access to literature in biomedical and life sciences]
- *CAB Abstracts* [provides access to literature in applied life and agricultural sciences]

- *INSPEC* [provides access to applied sciences literature in physics, electronics, control engineering, computing and information technology]
- *PsycINFO* [provides access to literature in behavioural sciences]
- *FSTA* - Food Science and Technology Abstract
- **External Contents**
There are a number of external contents, like, *AGRICOLA*, *PubMed*, the *Cochrane Library* [Abstracts of Cochrane Reviews], *AIAA Meeting Papers*, *arXiv.org e-Print Archive* [on Computer Science, Mathematics, Non-linear Sciences and Physics], *ASCE Civil Engineering Database*, *NASA Astrophysics Data System*, *National Technical Information Service Product Search*, *AskEric* and *Popline*.
- **Information Management Tools**
 - *WebFeat Prism* [enables searchers to extend their cross search to include freely available Internet resources and library's proprietary collections]
 - *ICate* [*One Click Access to Everything* – Open URL-compatible links-server for directly access to full-text documents hosted by primary publishers]

ISI Web of Knowledge caters almost all types of information needs. The *Current Contents Connect* provides information related to current needs. *ISI Web of Science*, *ISI Proceedings*, *Derwent Innovation Index* and some other information products available as hosted contents provide information related to exhaustive needs. Some external contents, accessible through *ISI Web of Knowledge* provide information related to everyday needs as well as catching-up needs. Thus, these information products offer dynamic and diversified information services in almost every discipline integrating a number of valuable information products.

Self Check Exercise

11) What are the Core Contents and Analytical Contents of *ISI Web of Knowledge*?

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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J-Gate

The J-Gate is journal content gateway service for libraries and information centres, provided by Informatics (India) Limited, Bangalore since 2001. J-Gate provides Internet-based access to contents of more than 14,000 journals from more than 3,000 publishers. It provides table of contents of journals. The service also includes more than 3,000 open access journals, where full-text articles are available free of cost to the users. J-Gate provides hyperlinks to online full-text articles if these are available through either publishers' web portals or database providers' web portals. The J-Gate databases can be searched through various access points, like, subject, author, keyword, etc. It covers only journals published in English language. The J-Gate subject categories are: (i) Agricultural and Biological Sciences, (ii) Arts and Humanities,

(iii) Basic Sciences, (iv) Biomedical Sciences, (v) Engineering and Technology, (vi) Social and Management Sciences, and (vii) Library and Information Science. The users can search by single subject category or more than one subject categories or all subject categories at a point of time. There is much more customisation of this service, for example, users can limit their search to only UGC INFONET covered journals.

J-Gate further customises this service into J-Gate Custom Content (JCC) Service and J-Gate Custom Contents for Consortia (JCCC) Service. JCC customises access to contents of journals subscribed by any library or information centre. The users of a library can access the table of contents of subscribed journals, can search bibliographic records of such journals, and can browse full-text contents of selected items. JCCC provides customised content of selected journal sources, as specified by the participating libraries and information centres in a consortium. JCC and JCCC also provide customised table of contents of selected journals directly to the users' e-mail accounts at regular interval. This e-mail alert service is known as *MyTOC*. Here users voluntarily create their interest profiles and select some journals in their core areas of activities. It matches the users profiles and documents profiles to cater current information needs appropriate to the users.

The J-Gate provides information related to current information needs as well as information related to exhaustive information needs. For example, table of contents of current issues of journals provide information related to current information needs, whereas, the bibliographic databases of journal articles provide information related to exhaustive information needs.

13.6 AIDS TO INFORMATION SOURCES

You have already known different types of information sources available in print and non-print media; various information systems and programmes have geared to meet local, national and international needs, or the specialised needs of scholars devoted to a particular discipline. You have also seen how the information services can be customised and rendered tailor made.

You might have observed and realised that having an idea about various types of information sources and services is not enough to provide a highly satisfactory information service. There is a need for some aids which help to reach at the sources more quickly and efficiently. We will be discussing some of them in this section.

Every documentary information source has a key to its content, which we call as the table of contents. Sometimes it provides index which points to a particular concept dealt within the document. At times, some additional aids like the explanatory notes are also provided for a quicker understanding of the information content of a document or a set of documents. The secondary information sources such as abstracting and indexing services act as a key to primary sources of information. Similarly, tertiary information sources act as a key to both primary and secondary sources of information. All these, i.e. table of contents, indexes, explanatory notes, indexing services, abstracting services, guides to reference sources, directories, etc. may be termed as documentary aids to information sources. A reference librarian is considered as a non-documentary aid to information sources.

In this section, we shall address ourselves to various types of information sources and their corresponding aids. As far as possible, we shall try to provide examples for various types of aids, which will equip you better to understand different items of information contained in the document, to retrieve desired information quickly, and to perform well with even a lesser number of information sources at your disposal. It is but a common

experience with reference librarians that many times these aids fail to retrieve a particular piece of information, even though it is present in a document. For this, one needs to develop special skills.

Information Sources

By physical form, information sources can be categorised broadly as documentary and non-documentary sources. We are concerning ourselves only with the documentary sources, which are categorised as primary, secondary and tertiary sources depending upon their contents.

You are all familiar with the above-mentioned types of information sources and have a varying degree of knowledge about their contents and uses. You must have also worked with some of them. Indexes to these publications, wherever they are available, have also been used by you. What have been ignored in most cases are the explanatory notes and the contents which at times act as the most valuable of the aids. Let us now be conversant with some of these aids.

Meaning of Aids to Information Sources

A document or a part of a document, or a person that helps in locating the desired information in a source is termed as an aid to information sources.

A document may be a guide to information sources, viz. Bottle's *Use of Chemical Literature*. The part of a document may be table of contents or its indexes. A person as an aid may be a reference librarian. There are other aids also like, table of contents, indexes, cumulative contents and indexes, explanatory notes, lists of tables and list of illustrations that help us in locating information.

Now, electronic forms of aids to information sources are rapidly gaining popularity for various reasons. Journals, abstracting and indexing databases, and other information products are now available in online electronic form, i.e. Internet based, as well as offline electronic form, i.e. CD-ROM based. The researchers could resolve time and space barriers for accessing these kinds of information sources.

Self Check Exercise

12) What do you mean by aids to information sources?

- Note:** i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

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13.6.1 Table of Contents

Each information source that we are concerned with, is provided with a contents page, wherein figures the table of contents or simply the contents of the document. The famous current awareness service called *Current Contents* is based entirely on the table of contents of journals. Presently, *Current Contents Connects*, the Internet

version of *Current Contents* is one of the much sought after services of Thomson ISI for quick access to the journal contents. Table of contents of a number of scholarly journals are now available through the publishers' websites. As and when a journal issue gets published the members of learned community can access table of contents of that issue in Internet, overcoming usual time lags. Table of contents of other printed documents, like, reference materials, conference proceedings, technical reports and special journal issues, are sometimes accessible over Internet either through the publishers' websites or through vendors' websites or through host institutions' websites (in case of conference proceedings).

In many cases, the table of contents acts as the only key to the contents of a document especially in reference materials, textbooks, conference proceedings, individual issues of research periodicals, and technical reports, which do not provide an index. In certain cases, the table of contents complement the role played by an index. In a majority of the printed versions of abstracting and indexing periodicals, this is the case.

13.6.2 Indexes

Indexes prove to be the greatest aid to information sources. As such, primary, secondary and tertiary sources – all have indexes with a few exceptions. Indexes try to provide all possible approaches to the authors, document number (e.g., patent no., report no., etc.), thought content, and even to the bibliography or citations appended to a document. It is, therefore, natural that indexes are many and varied, and the number and type of indexes are dependent on the nature of the publication. Among the abstracting periodicals, the *Chemical Abstracts* (CA) has the largest number of indexes, which can be broadly grouped as issue indexes (indexes brought out with each issue), and volume indexes (indexes brought out with every volume). Each issue of CA contains a keyword index, a patent index and an author index. The volume indexes comprise author, subject, formula, patent, chemical substance, and registry number indexes. For sometimes it also brought out HAIC index. *Biological Abstracts*, on the other hand, have got apart from author and BASIC indexes, Biosystematic index. *Directory of Scientific Research Institutions in India* provides as many as fifteen indexes, embracing abbreviation, chemical analysis, animal houses, chronology, consultancy, equipment, germplasm institutions, keyword, personnel, places, publications, testing facilities, training facilities, and subject. As an example, the details of the indexes provided by the Chemical Abstracts and Biological Abstracts have been discussed at the appropriate places in the following sections.

Personal Author Index

It is one of the most common indexes found in almost all types of information sources. In this, the name of the author is associated with the page number or number of the entry. However, certain variations are not uncommon. For example, in *Referativnyi Zhurnal* the names of the Slavic authors appear in Cyrillic, and non-Slavic authors in Roman characters. The author index of Chemical Abstracts appearing in volume index is also different from others and includes the title or part of it. For example:

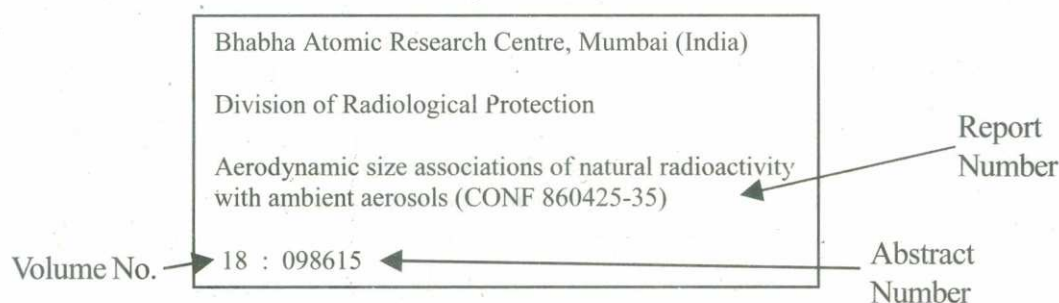
Rudolf, Paul F H Production of city gas from solid and liquid fuels 65:15112 e
--

Corporate Author Index

Many documents such as, technical reports, standards and patents, are produced by corporate bodies like institutions and organisations. As such, Corporate Author

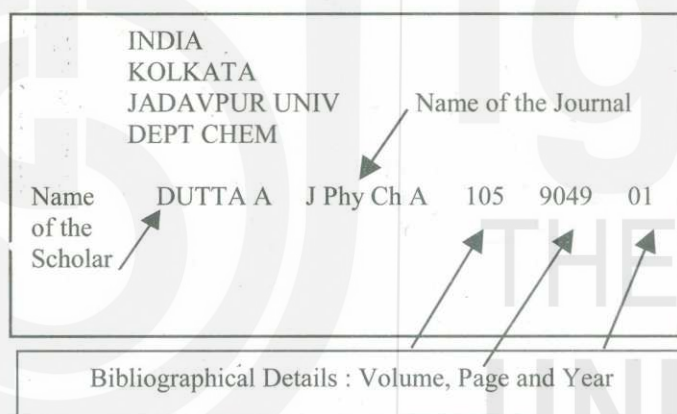
proves to be an important approach for locating a document. *Physics Abstracts*, *INIS Atomindex*, etc. provide Corporate Author Indexes.

An example of the Corporate Author Index is reproduced from *INIS Atomindex*.



Author Affiliation Index

Teachers, students, and researchers conducting research always intend to know the latest development in their respective fields. The information appearing in printed documents (being by and large outdated) obliges the researchers to have contacts with all those investigating the same or closely related problems. This very factor justifies the introduction of the affiliation index in *Science Citation Index*, *Social Science Citation Index*, *Current Contents*, and *Engineering Index* and so on. An example from *Science Citation Index – Source Index* (Jul-Aug 2004) is shown below:



Self Check Exercise

- 13) What is an author affiliation index? How does it differ from corporate author index? How does the former acts as an aid to information sources?

Note: i) Write your answer in the space given below.

- ii) Check your answer with the answers given at the end of the Unit.

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Personnel Index

In certain directories we encounter this type of index. A directory of institutions usually includes the names of its chief and others. Similarly, a directory of research projects

normally includes the name of the researcher(s) and the guides. Hence, a personnel index helps to locate the person along with his/her designation and address. *Commonwealth Universities Yearbook*, *Directory of Scientific Research Institutions in India*, etc. provide the personnel index.

Subject Indexes

Of all the indexes, the subject index is the most important one, and is found in almost all categories of publications. These are a key to the thought contents of documents. In order to ensure correct retrieval of a relevant document, various types of subject indexing such as PRECIS, KWIC, KWAC, KWOC, etc. have evolved. A few of these indexes are discussed here.

Chemical Abstracts (CA) of Chemical Abstracts Service (CAS) provides a variety of subject indexes.

i) Keyword Index

Each issue of CA provides a keyword index. It is, however, different from keyword indexes like BASIC. Here, each keyword, arranged in alphabetical order and is followed by the context, which usually occurs in subsequent line(s). For Example:

Acetoacetamide	Hydroxyl cyclocondensation acyl Chloride 175635g
Acetracetate	Allylation molybdenum diphos Catalyst 175186m
	Detn. Urine 172231m
	Reaction product picryl chloride 175315 c

In CA, many such words used frequently are abbreviated both in the abstracts and indexes. In the foregoing example 'detn' is the abbreviated form of determination.

ii) Conventional Subject Index

The Conventional Subject Index is one of the volume indexes of CA and comprises two parts called *Chemical Substance Index* and *General Subject Index*.

a) Chemical Substance Index

The *Chemical Substance Index* consists of an alphabetical listing of CA index names – each of which identifies a specific chemical substance – linked to their appropriate abstracts numbers. CAS Registry Numbers are provided with this index. Entries also include the text-modification phrases that describe certain aspects of the substances that were studied. For Example:

Benzoic acid (65-85-0)	←	CAS Registry Number
B 1246g, R 286956		
Benzoic acid (65-85-0)	←	
Chromatog of 75444t		
Detn. of, in food 41804 d		

b) General Subject Index

This index links subject terms, such as chemical reactions, classes of chemical substances, and scientific names of plant and animal species, with their corresponding CA abstract numbers. Most entries include a text-modification phrase, which further describes aspects of the topic covered in the original document. For Example:

Carbohydrates and sugars, analysis detn. of in beer and worts 76371 q in sugarbeet 171845 f Carbohydrates and sugars, compounds lignin complexes 35515 w.

iii) *Formula Index*

There are specific molecular formulae for every chemical substance, and as such, the *Formula Index* provides a good approach for searching chemical literature. Knowing the chemical formula of a compound is not enough to handle a formula index, as it follows a specific way of presenting the chemical formula. In this case, chemical formulae are arranged in alphabetical order. Within a chemical formula, the figuring elements are also arranged in a specific order, resulting thereby in an alternation in the order of the elements found in conventional formulae. For example, the conventional chemical formula for Benzenemethanaminium is $C_{11}H_{18}N$ following the alphabetical order of C, H and N. The *Formula Index* links molecular formulas with their CA index names, CAS Registry Numbers, and CA abstract numbers.

Example:

$C_{11}H_{18}N$		
Benzenemethanaminium, N-ethyl-N, N-diaethyliodide [7375-17-9], P 39849		
Pyridinum, 1-hexyl-chloride	[6220-15-1],	82373 p
	↓	↓
	CAS Registry Number	CA Abstract Number

iv) *CAS Registry Number*

CAS Registry System is a computer-based system that automatically identifies two-dimensional structural diagrams of chemical substances and assigns to each a unique CAS Registry Number. This number is then used within a larger processing system to link the molecular structure with CA index name and other data. CAS Registry System introduced in 1965 and recorded more than 23 million unique structures till the end of 2004. New structures are being created at a rate of more than one million per year.

Biological Abstracts (BA) of BIOSIS provides a variety of subject indexes. These are:

i) *BASIC*

BASIC (Biological Abstracts Subjects in Context), a good example of KWIC index, is one of the earliest automated indexes in the world. The index is divided into three columns. Each keyword figuring in the title appears alphabetically in the second column. The parts of the title preceding and following the first word in the second column provide the context. The third column provides the serial number of the entry. For Example:

The title 'Biological acclimatization of animals' will appear in the index thrice as it has three keywords, viz., biological, acclimatization and animals. The index will assume the following form:

Biological	<i>acclimatization</i> of animals	005069
acclimatization	<i>animals/</i> Biological	005069
of animals	<i>Biological</i> acclimatization	005069

Self Check Exercise

14) Explain a keyword index taking the example of BASIC.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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ii) *Biosystematic Index*

The Biosystematic Index lists taxonomic categories along with the number of the abstracts published in an issue or volume. Under each taxonomic category, information regarding the organisms belonging to that category is given. Moreover, an abbreviation representing a BA subject section or subsection, figuring adjacent to an entry, provides further insight about the nature of the abstract. For Example:

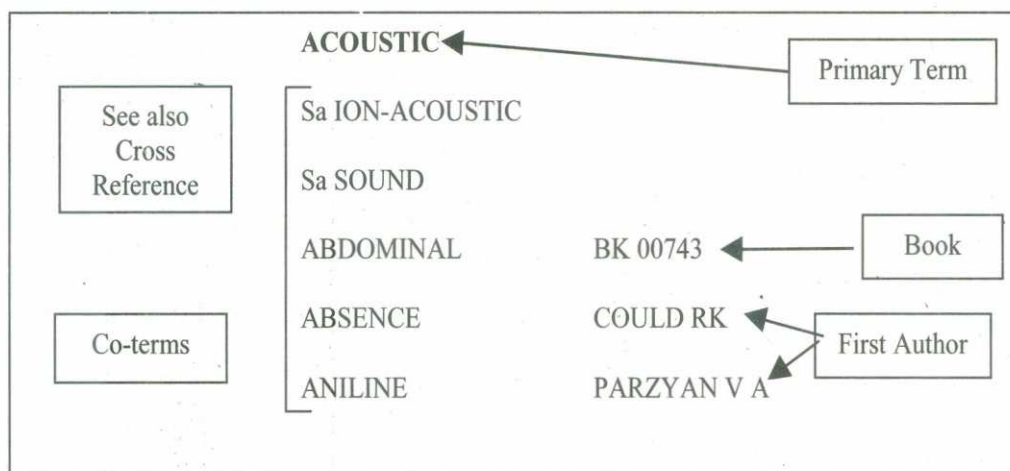
Taxonomic Category	Algae		
	Chlorophyta	Genet Plant	10744
	Chlorophyta	Ocean Limnol	11025
	Taxonomic Subcategory	Abbreviation of BA Subject Section for Genetics and Cytogenetics, Plant Abbreviation of BA subject Subsection for Oceanography and Limnology	Abstract No.

Science Citation Index (SCI), Social Science Citation Index (SSCI) and Arts and Humanities Citation Index (A&HCI) of ISI provide a subject index, known as Permuterm Subject Index.

Permuterm Subject Index

This index, forming a part of the *Science Citation Index* (SCI) or *Social Science Citation Index* (SSCI) or *Arts & Humanities Citation Index* (A&HCI) is a permuted index, based on the title words of a journal article, chapter of a book or a book. In the index every significant title-word is paired with other words figuring in the title. Every

titled-word, arranged in alphabetical order, becomes a primary term by turn. For Example:



In the example, each co-term is followed by the indication of a book or the name of an author. If the author's name is preceded by an arrow, one can straightway look up under the author's name in the source index, where he/she will find the entire bibliographical details of the article containing the primary term and the co-term. Basically, this index is used to locate articles on various topics mainly to compile a bibliography.

Indexes to Documents

Apart from articles, abstracting and indexing services also cover such documents as patents, technical reports, conference proceedings, books and bibliographies and provide indexes to facilitate retrieval of these documents. We shall describe all these indexes.

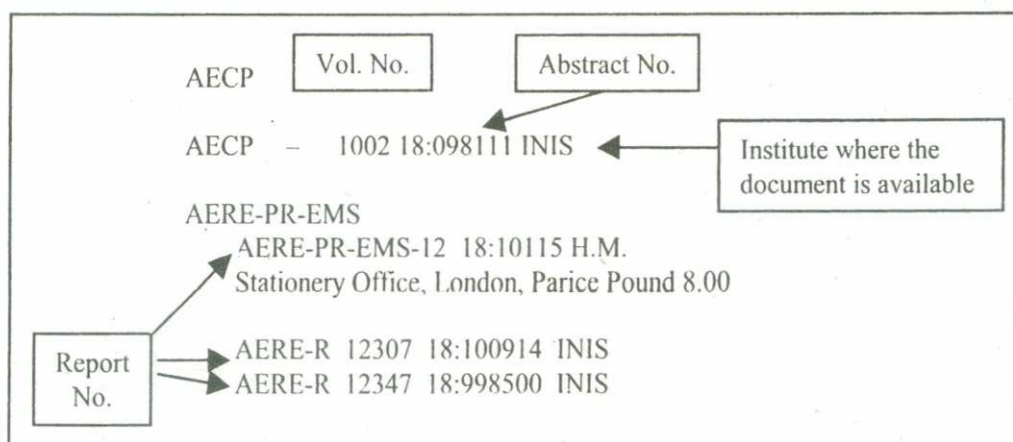
i) Patent Index

The *Patent Index* of Chemical Abstracts is an alphabetical listing of patent offices. Within the listing for each country, patents are arranged in ascending numerical order. Each patent number is followed by either a CA abstract number and a complete history of all equivalent documents, or a cross-reference (see) to the patent-number of the first abstracted patent in the patent family. The earlier *Numerical Patent Index* and *Patent Concordance Index* has since been replaced by *Patent Index*. An entry from the same is given below:

DE (Germany)	
	2361142 A1, 82:3320p
	FR 2210654 A1
	GB 1417525 A
AT (Australia)	
	6252 E, see EP 36636 A1

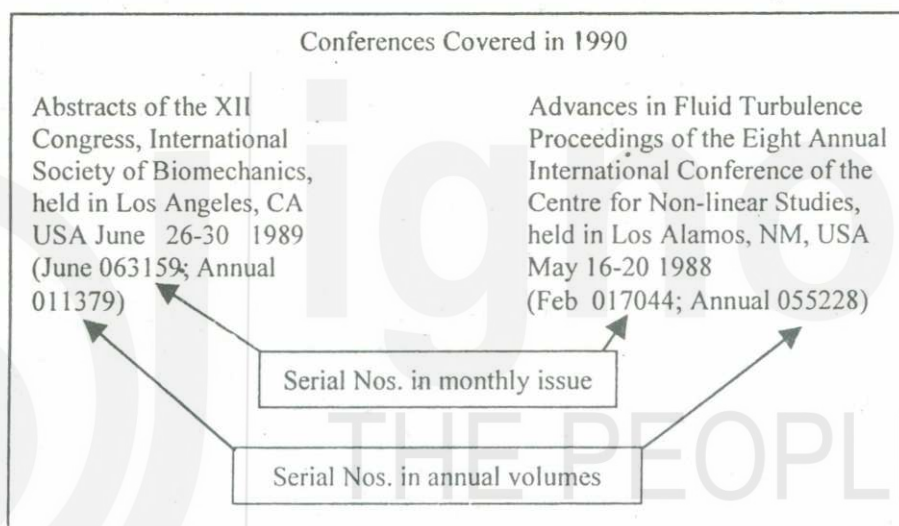
ii) Index to Technical Reports

Technical reports form important documents in the fields of nuclear, space and defence science and technology. Some secondary services covering technical reports provide separate indexes to technical reports. *INIS Atomindex* is one of them. A few entries pertaining to report number is being reproduced from Report, Standard and Patent Number Index of *INIS Atomindex* vol. 18.



iii) Index to Conference Documents

Conference documents are also covered by a number of secondary services like *Engineering Index*. Some of the services provide separate indexes for conference documents. An example is given from *Engineering Index Annual 1990*.



iv) ISSN Index

Ever since the advent of International Serials Data System, each serial is being provided with a unique number called International Standard Serial Number (ISSN) to facilitate its infallible identification. As such, ISSN has become a very good approach for locating a serial. *Ulrich's International Periodicals Directory, Serials Directory*, etc. provide ISSN index. The following example is reproduced from *Ulrich's International Periodicals Directory 1996*, 34th edition.

ISSN Number	Name of Periodical	Page
0019-5987	Indian Museum Bulletin.	4812
0019-6002	Indian National Bibliography.	510
0019-6061	Indian Paediatrics.	4521

v) Place Index

Atlases, Gazetteers, certain directories, abstracting/indexing services, railway timetable provide place indexes. The place index of atlases is different from other place indexes as the former provides the longitude and latitude of the place along with the page number wherein the particular place figures in the map.

vi) *Abbreviations Index*

Abbreviations are used in different types of publications such as directories, yearbooks, and secondary services like the *Chemical Abstracts*. Hence, in many such publications, a list of abbreviations is found with their corresponding expansions.

vii) *Chronological Index*

This index is usually found in some historical publications, directories, etc. The type of information may vary from index to index. Some examples will clarify the point.

The following portion of the chronological index drawn from the *Directory of Scientific Research Institutions in India* shows the scientific institutions established in India in the year 1909.

Agricultural Research Stations, Arbhair
Indian Institute of Science, Bangalore

The Date Index the *World Meetings – Outside United States and Canada* shows the various projected dates of future conferences. Each entry in the index provides sequentially the date, venue, sponsor, keywords of the official title of the meeting and the registry number.

13.6.3 Cumulative Contents and Indexes

Every issue of a primary periodical contains the table of contents and normally the subject index is provided once a year along with the annual issue. In many periodicals the table of contents are cumulated annually, and subject indexes 5-yearly, 10-yearly, and so on. The cumulative indexes are also sometimes brought out covering a much longer period. For example, *Index to the Publication of the Asiatic Society 1788-1953*, compiled by S. Chaudhuri provides:

- i) Author index to *Asiatic Researches, Journal* (three series upto 1953), *Memoirs* and *Miscellaneous Publications* in Vol. I, and
- ii) Index to *Bibliotheca Indica* and Monographs and author index to Notices and Proceedings. Similarly, many periodicals in the world have brought out cumulative indexes.

Secondary periodicals also bring out yearly, five yearly, 10-yearly commulative indexes. *Chemical Abstracts* has brought out a very large number of cumulations covering author, subject, patent and formula indexes. These cumulations are mostly quinquennial (five yearly) and decennial (ten yearly). Recently, Chemical Abstracts Service has brought 25 years of CA Collective Indexes on CD, a convenient electronic references of scientific documents from 2001 back to 1977. It covers 13.7 million abstracts and 2.9 million patent equivalent references in 58 discs.

These indexes are undoubtedly very valuable aids for locating information, and of course, in electronic search the researchers save a great deal of time and energy. Now, A&I publishers offer more exhaustive collections of secondary databases with more flexible search facilities through Internet.

13.6.4 List of Tables

Many a time readers are interested in numerical data. Statistical publications, handbooks, yearbooks, etc. contain a great deal of numerical information. These apart, certain periodicals like *RBI Bulletin*, monographs and other publications also

contain numerical data. As a key to the numerical data contained in the book, a list of tables is also provided. The list helps readers to navigate the tables that contains the required information and thereby saves a lot of their valuable time.

The following example will give you an idea on the List of Tables, which is arranged in a very simple way. The document is: *India Human Development Report: A Profile of Indian States in the 1990s* by Abusaleh Shariff (National Council of Applied Economic Research) [Delhi: Oxford University Press, 1999].

List of Tables	
1.1 Human Development Profile of Rural India, 1994: Selected Indicators for States	7
1.2 Human Development Profile of Rural India, 1994: Selected Indicators for Population Groups	8
2.1 Rural Sample by States	18
3.1 Levels of Income and Poverty Line by States	25
9.1 Percentage of Villages and Availability of Different Facilities by States	188
9.2 Relationship between Village Development Variables and Selected HDIs	192-194
Annex 1 Allocation of Sample Households in States	220
Annex 2 Estimated Parameters for States and Standard Errors	221-224

13.6.5 List of Illustrations

Certain publications provide list of illustrations such as maps, portraits, photographs and so on to ensure quick location of the items in the document. Obviously, these lists are also valuable aids for locating a place, a photograph of a person, and so on.

13.6.6 Explanatory Notes

Dictionaries, encyclopaedias, directories and many other sources of information provide *explanatory notes* to make every item of information included in the document, easily comprehensible to the user. They may be called by different names but the purpose remains the same. Normally, librarians do not pay much attention to such particular *aid* provided in reference books, and therefore, fail to attain complete mastery over the information source.

Information sources are continuously becoming more and more complex. Readers, being infrequent users of most of these sources generally are not aware of some signs, symbols, expressions, and explanations used in a document, and may, therefore, seek help. For example, while consulting a dictionary, the reader may not know, why some words start with capital letters, while others do not. Explanatory notes helps in overcoming such difficulties.

The *Explanatory Notes* provided in the *Webster's Seventh New Collegiate Dictionary* explains various items under 21 headings such as (i) the main entry; (ii) the pronunciation, (iii) functional tables, (iv) inflectional form, (v) capitalisation, (vi) attributive nouns, (vii) the etymology, (viii) status labels, (ix) subject labels, (x) the symbolic colon, (xi) sense division, (xii) verbal illustration, (xiii) name of plants, and

animals (xiv) usage notes, (xv) cross references, (xvi) run-on entries, (xvii) synonyms, (xviii) combining forms, (xix) the vocabulary entry, (xx) proper names, and (xxi) abbreviations.

By going through all these items and understanding their significance you will be better equipped to deal with lexicographic queries. This is true in the case of the explanatory notes of other publications as well.

Self Check Exercise

15) Describe the role of explanatory notes in the retrieval of information from a document.

Note: i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of the Unit.

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13.6.7 Propaedia

The Propaedia of the *New Encyclopaedia Britannica* is a unique example of an aid provided to locate the required information from the huge store of 20 volumes forming Macropaedia. The Propaedia is a non-alphabetical guide to information contained in Macropaedia. In it, knowledge has been divided in 10 major divisions: (i) Matter and Energy; (ii) The Earth, (iii) Life on Earth, (iv) Human Life, (v) Human Society, (vi) Art, (vii) Technology, (viii) Religion, (ix) the History of Mankind, and (x) the Branches of Knowledge. Each division has been further divided giving indications to articles figuring in the Macropaedia. In order to have a complete picture of information presented on a topic, the consultation of the Propaedia is but sine qua non.

13.6.8 Abstracting/Indexing Services

New research findings, original ideas, inventions, innovations, etc. are being reported in various types of documents, numbering millions and emanating from all over the world in scores of languages. It has been observed that original scientific literature is emanating from more than 130 countries of the world in 66 languages. If we take the entire original literature embracing science and technology, social sciences, arts and humanities, then the number of countries and languages will definitely go up along with the volume of literature. The total output of such literature is estimated to be several millions per year. All those documents harbouring this huge output of literature are, as you know, primary sources of information. A reader may have direct access to a few of them but not all. A researcher likes to know about all the documents dealing with his/her narrow field of research. For this some aids are essential. Abstracting and indexing services are the aids that help researchers, bibliographers and others to ferret out required information from the incredibly huge jungle of literature. With the advent of

computerised databases, the search has become easy and much less time consuming. However, our scientists find the cost of the search quite high compared to the cost of manual searches.

A/I services are presently available in electronic forms as well as printed form. In electronic forms, these are available either online or off-line. Offline electronic form is CD-ROM based that gives freedom from bulky printed volumes. Online services are presently available in Internet, and other online access modes have lost its relevance.

13.6.9 Book Reviews

Newspapers, magazines and scholarly journals regularly publish book reviews of recently published non-periodical documents, like, monographs, technical reports, study reports, conference proceedings, reference materials, and so on, which are broadly categorised for inclusion in this sections. Some scholars also depend upon these non-periodical documents for their advanced studies, which are acknowledged in the references (citations) of their published documents. Learned reviewers critically review these materials, and give their views related to the thought contents of the documents. The reviewers judge the value of the documents and suggest their quality. Some eminent writers or scholars share their knowledge in the form of books and related documents, which may be contributory to the existing body of knowledge. The readers not only get content information, but also information on scope, coverage, depth and quality of the document. In the areas of social sciences, humanities, arts and literature, many primary publications are published in non-periodical forms. So, the book reviews section in the periodicals is very important aid to information sources.

There are a few indexing periodicals to provide access to book reviews published in different periodicals, like, *Book Review Index* and *Book Review Digest*. The *Book Review Index*, started in 1965, indexes all reviews in over 500 periodicals. It is a bimonthly periodical with annual cumulative volume and published by the Gale Research. The *Book Review Digest*, published since 1907, includes excerpts to reviews of current adult and juvenile fictions and non-fictions. It is a monthly periodical, published by H.W. Wilson, having quarterly and annual cumulative volumes. It is also available on CD-ROMs and through Internet subscriptions.

13.6.10 Guides to Information Sources

You have seen that secondary sources like the abstracting and the indexing services, act as aids to primary sources of information. The secondary and tertiary sources of information have grown not only in variety but also in size. It has become almost impossible for any librarian to remember all secondary and tertiary sources of information belonging even to a narrow field. Moreover, newer sources of information are always emerging. As an answer to this problem, guides to information sources have emerged. You have already learnt about Sheehy's *Guide to Reference Books*, Walford's *Guide to Reference Material*. Both these guides cover reference books belonging to all fields of knowledge. There are guides which are devoted to a specific field of knowledge, say social sciences, biology, chemistry and so on. These, obviously, are more comprehensive than Sheehy's or Walford's guide, and more helpful for searching literature in a narrow area.

13.6.11 Reference Librarian

A reference librarian is one of the most important aids for retrieving information from various sources. Handling diverse enquiries from a multitude of users over the years, reference librarians acquire in-depth knowledge of numerous reference sources, which helps them to locate information with ease and confidence and without any loss of time.

13.7 INTERNET AS AN AID TO INFORMATION SOURCES

In the previous sections you have learnt about various aids to information sources, such as, table of contents, indexes, cumulative contents and cumulative indexes, list of tables, list of illustrations, explanatory notes, etc. All these are distinct items and may be physically available in libraries and information centres to facilitate gathering information on the source documents. Some of these aids to information sources may also be available on the Internet which also help the searchers to get information quickly.

Varieties of information are accessible through the websites, which are developed, maintained and updated by some commercial as well as non-commercial organisations. The hyper technologies enable Internet to provide access to multimedia contents, like, textual, audio-visual and graphical information.

Some of the concepts that emerged along with the proliferation of Internet resources are digital library, virtual library, e-library, e-journals, e-books, e-newspapers, e-magazines, e-commerce, e-business, e-governance, e-learning materials, beside many others. Internet also incorporates various databases which can be accessed online. Some databases get input data directly from the Internet users for certain purposes, such as, users' profile related data.

We know that the primary information is getting accessed through the secondary information services. Many secondary information service providers give access to their bibliographical or abstracting databases as well as full-text databases through Internet. Some of these services are subscription based, and some others are free with limited access. Internationally reputed journal publishers provide access to table of contents of latest issues of the journals through their own websites or through secondary service providers' websites. For example: National Institute of Science Communication and Information Resources, India (NISCAIR) publishes a number of scholarly journals; and these journals' table of contents are available in its website (<http://www.niscair.res.in>). Similarly, table of contents of journals of Indian Academy of Sciences are available in its website (<http://www.ias.ernet.in>). Indian National Science Academy (INSA), Indian Academy of Sciences and many other institutions provide full-text access to scholarly journals published by them through their websites. Secondary information service providers, like, Institute of Scientific Information (ISI), BIOSIS, COMPENDEX, INSPEC, are providing access to their databases through Internet, where search services are much flexible and powerful than their printed or CD-ROM based products. The search facilities support a number of approaches or access points when users access through electronic modes.

Different groups of information generators and communicators are using powerful Internet technologies to reach the consumers of information products or services. Information in varying degrees on books and reference materials can be found in the publishers' websites, online booksellers' websites, and many libraries' web-OPACs. Information on books and reference materials can contain bibliographic information, table of contents, list of tables, lists of illustrations and book reviews. Many Web-OPACs or web-based online public access catalogues are hosted by respective libraries of the world. Examples of some of the popular web-OPACs are:

- Library of Congress <<http://catalog.loc.gov>>
- British Library <<http://catalogue.bl.uk>>
- National Library, Australia <<http://catalogue.nla.gov.au>>

Online vendors sell books, reference materials, DVD, music, videos, multimedia materials and magazines, beside many other items through their websites using e-commerce technologies. They maintain large databases of items for online access that provide information on such items including buying information, bibliographic information, table of contents, excerpts as well as editorial reviews and customer reviews. These websites are versatile aids to information sources. The *Amazon.com* <<http://www.amazon.com>> and *Wal-Mart Store* <<http://www.walmart.com>> are examples of internationally popular online vendors for books, magazines and other items.

Internet is an outgrown source of information that has billions of web documents. Certain facilitators provide search facilities to this exhaustive source of information. These facilitators are web search engines. A web search engine is a website that maintains directory of databases of other websites. These search engines are well maintained and upgraded regularly, to keep pace with the growing web spaces.

Table 13.3 shows top ranking search engines available today. Some search engines are powered by either Google search engine or Yahoo! search engine, or any other, due to Google and Yahoo! search engines have strong search capabilities. The National Informatics Centre (NIC) of India maintains web directories for government departments, institutions, programmes and documents, which can be searched through its website <<http://goidirectory.nic.in>>. Some search engines are powerful to generate relevant search results for some specific kinds of documents, like, articles, news, music, movies, etc. Google's *Scholar* can generate search results from scholarly communications like journal articles, conference articles, and research reports. Similarly, LookSmart search engine has strong indexes for magazine articles.

Table 13.3: Top Ranking Web Search Engines

Name of the Web Search Engine	URL
Google	http://www.google.com
Yahoo	http://www.yahoo.com
Ask Jeeves	http://www.askjeeves.com
AllTheWeb	http://www.alltheweb.com
AOL Search	http://aolsearch.aol.com (internal) http://search.aol.com (external)
HotBot	http://www.hotbot.com
Teoma	http://www.teoma.com
AltaVista	http://www.altavista.com
Gigablast	http://www.gigablast.com
LookSmart	http://www.looksmart.com
Lycos	http://www.lycos.com
MSN Search	http://search.msn.com
Netscape Search	http://search.netscape.com
Open Directory	http://dmoz.org

(Source: www.SearchEngineWatch.com, February, 2005)

Table 13.4: Online Information Resources

Type of Information Source	Example of Internet Resource
Primary Source of Information (Full-text)	IEEE Electronic Library <www.ieee.org>
Secondary Source of Information	ISI Web of Science <www.isiwebofscience.com>
Tertiary Source of Information	Ulrich's Periodicals Directory <www.ulrichsweb.com>

Table 13.4 shows that every kind of information can be found in the cyberspace to satisfy various kinds of information needs of varieties of users. Some of these web-based information products are accessible online through subscription based services, whereas many freely accessible web documents are also available.

Thus, Internet acts as an important aid to information sources. Internet is used very frequently to support current information needs as well as exhaustive information needs of the users. But the way Internet is growing it requires human intervention to provide much focused information support. Library and information professionals can be better utilised here to create a gateway of Internet resources with powerful indexes and catalogues that would save the searchers from getting lost in cyberspace.

Self Check Exercise

- 16) Do you think that the Internet will emerge as a single greatest aid to information sources?

Note: i) Write your answer in the space given below.
ii) Check your answer with the answers given at the end of the Unit.

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13.8 SUMMARY

In this Unit, we have discussed content analysis and its applications in library and information services; customised organisation of information services according to the information needs of users; citation analysis, cito-analytical products and their applications in information services; and both documentary and non-documentary aids to information sources. Various kinds of electronic sources of information, both online-based (Internet resources) and offline-based (CD-ROM or Floppy), have also been discussed in this Unit. A fairly detailed section on 'Information Aids' is included, drawing attention to their indispensability, in using a plethora of information sources, in the form of bibliographical tools and reference materials. Using all these resources, tools and techniques, a professional librarians can provide value-added information services to the end users.

13.9 ANSWERS TO SELF CHECK EXERCISES

- 1) Content analysis forms the bedrock for knowledge organisation in general and libraries and information centres in particular. Combined with classificatory techniques, the process of organisation of knowledge and information present very powerful method of access and retrieval. In fact, these processes include analysis, combination, ordering, discrimination, assimilation, conservation, inquisition, innovation, intention.
- 2) Some of the areas of library and information services wherein content analysis can be usefully applied are:
 - a) subject indexing,
 - b) classification,
 - c) user analysis,
 - d) literature search,
 - e) information retrieval,
 - f) reference service,
 - g) abstracting and condensation, and
 - h) consolidation and repackaging such as reviews, state-of-the-art and trend reports.
- 3) The information sources are categorised as primary, secondary and tertiary sources. Primary sources are those which contain original contributions recorded for the first time, such as journals, thesis, reports, etc. Secondary sources are based on the primary sources and contain information about primary sources. In most cases, these do not provide information per se, but point to the availability and location of information. Tertiary sources are derived from the secondary sources and provide information relating to the sources of information.
- 4) User information needs have been grouped into four categories – current, exhaustive, everyday and catching-up. Current information need arises when the user wants to keep himself/herself up-to-date, current and alert with the latest developments of a subject. Exhaustive need arises when the user is interested to have the complete information about a subject. Everyday information need arises in course of the day-to-day work of the user. The need relates to specific information for which specific answer is required. Catching-up information need arises when any user, so long unaware about a subject, requires a brief but complete picture of the subject.
- 5) In order to make proper use of information, these sources need to be organised according to the need and requirement of the user. For organising the information sources, it is necessary to study the user's need. Based upon such need, the sources need to be organised which will enhance the usability of information. The realisation of the fact that information is a valuable commodity has put more responsibility on the producers of secondary information sources to tailor these according to the need of the user from all aspects – packaging of information content, physical form of availability, methods of presentation, etc.
- 6) *Current Contents* is brought out in seven separate sections:
 - Current Contents – Agriculture, Biology and Environmental Sciences
 - Current Contents – Arts and Humanities
 - Current Contents – Clinical Medicines

- Current Contents – Engineering, Computing and Technology
 - Current Contents – Life Sciences
 - Current Contents – Physical, Chemical and Earth Sciences
 - Current Contents – Social and Behavioral Sciences
- 7) Studies based on citations are being generally termed as citation analysis. They may be termed also as cito-analytical studies. Citation analysis is now a powerful tool to evaluate performance of researchers, institutions and countries. This is also a scientific method to study growth of literature and for mapping of knowledge.
- 8) The Chronology of Citation Indexes is:
- Science Citation Index (1963),
 - Social Science Citation Index (1973),
 - Arts and Humanities Citation Index (1978),
 - ISI Web of Science (1997).
- 9) Different parts of Science Citation Index are: Citation Index, Source Index, Permuterm Subject Index and Corporate Index.
- 10) The search options of ISI Web of Science are:
- Quick Search [Search for topic terms using Boolean operators (AND, OR, NOT, SAME) and wildcards (* ? \$)]
 - General Search [Search for records by topic, author name, source title, and author address]
 - Cited Reference Search [Search for articles that cite other works]
 - Structure Search [Search for chemical compounds and reactions]
 - Advanced Search [For experienced users who want to develop complex search strategies using field tags, Boolean expressions, and set combinations]
 - Open Saved Search [Search for records by opening a previously saved search history file].
- 11) Core Contents and Analytical Contents of *ISI Web of Knowledge* are produced by Institute for Scientific Information, Philadelphia, USA. The Core Contents are: *ISI Web of Science*, *Current Contents Connect*, *ISI Proceedings*, and *Derwent Innovation Index*. The Analytical Contents are *Journal Citation Reports on the Web*, *Essential Science Indicators* and *HighlyCited.com*.
- 12) A document, or a part of a document, or a person that helps in locating the desired information in a source is termed as aid to information source.
- 13) An author affiliation index provides the address of the institution or organisation to which the author is attached.

It differs from the corporate author index in the sense that the institution or organisation to which an author is attached is itself not the author, whereas in the corporate author index the corporate body is the author.

The author affiliation index provides the address of the author to facilitate correspondence, whereby the first hand information can be obtained directly from the author himself/herself.

- 14) The keyword index is a subject index based mainly on the significant words drawn from the title of a document. BASIC, i.e., Biological Abstracts Subjects in Context is also a keyword index. In this case, however, every keyword is attended with context.

The BASIC index comprises three columns. The first column reproduces part of the title preceding the first keyword appearing in the second column. The entire index is arranged alphabetically by the first word figuring in the second column. The part of the title preceding and succeeding the first word in the second column provides the context. The third column shows the serial number. The title 'Myxophyceae from the Ajee river near Rajkot' will appear in BASIC as follows:

Myxophyceae from the Ajee river near Rajkot	000177
river near Rajkot/Myxophyceae from the Ajee	000177
from the Ajee river near Rajkot/Myxophyceae	000177
Myxophyceae from the Ajee river near Rajkot	000177

- 15) Explanatory Notes provide explanation to a number of items to facilitate better understanding of the content of a document. Normally, reference books provide explanatory notes, to describe the arrangement of entries, various components of an entry, structuring of the content, and so on.

The explanatory notes play a big role in the retrieval of information. Suppose a reader wants to know which libraries in Delhi possess Indian Journal of Medical Research right from Vol. 1. The reference tool that can provide an answer to this question is the National Union Catalogue of Scientific Serial in India. On turning on the correct page of the aforesaid Catalogue, one will come across such symbols and data as given below:

ADIMAF	1,	1913/14 + /13-27, 32/(30,35,37,45-46)
ADIMAI	46,	1958+ (50)
ADIMIH	13,	1925/26+42-43,48-48/(16,18,28,50)

Now without going through the explanatory notes it is not possible to decipher the meaning of 6 digit symbols like ADIMAF, and the numbers, strokes and brackets following the symbol. Till their meanings are known, no information can be given to the user. The example illustrates the importance of the explanatory notes.

- 16) Internet has already mused as a single window provider of information supports. Many conventional aids to information sources are now available in Internet either through subscription or through open source. Now scholarly communication also gets a new high, with demolishing of time-space barriers. In matter of few moments, the searchers could locate their needed information in Internet. From primary communications to secondary and tertiary databases all are accessible through Internet to online subscribers of such items. This example can give an idea how rapid a communication can take place: a printed issue of a journal, published in Europe, could reach to the scholar's desk in India after two-three months long waiting (by sea-mail), but using Internet he/she can access the table-of contents of that issue, as well as the full-text contents, immediately after publishing. Thus, we can predict future scholarly communications will exploit Internet-based services much more.

13.10 KEYWORDS

- Archives** : Public records or historical documents kept in a recognised repository.
- Citing Half-Life** : The number of journal publication years, going back from the current year, that account for 50% of total citations given by the citing journal in the current year.
- Cito-analytical Product** : The document rehearsing the results of citation analysis.
- Co-term** : A term figuring in the source article title and subordinated to a primary term in the Permuterm Subject Index.
- Immediacy Index** : A measure to show how quickly the 'average article' of a particular journal is cited, and is expressed by the ratio of the number of citations received in a particular year, by the source items of the journal of the same year, divided by the number of the aforesaid source items. Mathematically, it can be expressed as:

$$I_i(J_Y) = \frac{c}{x}$$

Where $I_i(J_Y)$ = Immediacy index of the journal J for the year Y; c = Number of citations received by x source items published in journals J in the year Y; x = Number of source items published in journal J in the year Y.

- Impact Factor** : A frequency with which the average articles of the journal has been cited in a particular year. Normally, the citations received by a journal in a particular calendar year for its source items published in the preceding calendar year(s) are taken into account for determining the impact factor. In Journal Citation Reports (JCR), the set of source items published in the preceding two calendar years are considered. Mathematically, we can represent the JCR impact factor as

$$I_f(J_Y) = \frac{x_1 + x_2}{y_1 + y_2}$$

Where, $I_f(J_Y)$ = Impact factor of the journal J for the year Y; x_1 = Number of citations received by y_1 source items in the year Y; x_2 = Number of citations received by y_2 source items in the year Y; y_1 = Number of source items published in journal J in the year (Y-2); y_2 = Number of source items published in journal J in the year (Y-1)

- Patent** : A publication, issued by such an office, which gives details of designs and processes.
- Primary Term** : A term figuring in the source article title and appears as the main entry in the Permuterm Subject Index.
- Source Article Title** : The title of the source article covered by the *Source Index* of the *Science Citation Index*.
- Source Item** : A document, i.e., a research paper, a review paper, a short communication, etc. that has the potentiality of being cited.
(Synonym : Source document)

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